The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XIII. No. 320 AUGUST 1, 1925 Prepaid Annual Subscription: United Kingdom, £1.1.0; Abroad, £1.6.0.

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.

Editorial and General Offices—8, Bouverie St., London, E.C.4.

Telegrams: "Allangas, Fleet, London." Telephone: City 9852 (6 lines)

The Chemical Engineers' Tour

THE visit of the American chemical engineers to this country, starting from Liverpool on Saturday, July 11, and ending in London on Wednesday last, has been from every point of view a complete success. Judging from the expressions of satisfaction, it would be hard to say whether our American visitors or their British hosts are the more delighted with their experiences. The tour was an arduous one, equalling the highest American tradition for seeing the most in the shortest time; it was admirably planned both as to the time-table and as to the variety with which serious business visits, social functions, and excursions to places of historical interest succeeded one another; it leaves behind absolutely no regrets, but a harvest of pleasant personal memories and of useful commercial and technical experiences.

Some of our visitors were old friends, already familiar with British industrial conditions; others set eyes on Britain for the first time. Both saw some of the most beautiful spots, some of the noblest historical institutions and monuments, to be found in England, Scotland and Wales; at the Leeds conferences and elsewhere they had opportunities of learning something about our industrial and social problems and making acquaintance with our technical and commercial leaders; the visits to Yorkshire, Cheshire, and Scottish chemical works gave them some practical insight into the domestic side of our industrial life. The chemical technicians of both countries are the better for the pleasant days they have spent together, and the British Institution of Chemical Engineers and all who co-operated with them are to be congratulated on their public spirit and excellent organisation. When their turn comes to visit America, they will find, if we are any judges, a welcome that will strive to excel their own.

These international pilgrimages are to be encouraged from many points of view. For one thing, they tend to convince both nations how nearly one they remain in all essentials and above all, perhaps, in their moral outlook. This is not only for the good of both but for the good of civilization. It is also an advantage for Americans to see something personally of European conditions, and especially of what the war actually meant for Europe. Their detachment in the early stages of the war seemed to many at the time a trifle callous and selfish. In reality it was neither. Their remoteness from the strife made it difficult for them to realise the position as we knew it, and there was a reluctance to become involved in what they regarded as other people's affairs. That reluctance has not disappeared, but it need no longer be mistaken for indifference. The more Americans know of Europe the better qualified they will be to judge of its problems and the more disposed, we think, they will be to take their share of responsibility in settling them. In particular, Britain and the United States cannot know each other too well.

As to the immediate result of the chemical engineers' tour, it is difficult at present to attempt an estimate. Our guests have themselves spent so breathless a period that their impressions have not yet crystallised. Presently, no doubt, we shall hear something of what they think of us. Some points, however, they are already fairly clear about. The first is that, apart from the difference in the size of population and the scale of operations, there is no violent distinction between their methods and ours. Accustomed as they are to the mass production idea and to the practice of substituting mechanical for human labour wherever possible, some have been a little surprised to find hand labour employed here as fully as it is for routine work that is all done by machinery in America. In one case it was estimated that 300 men are employed here to attain an output for which in the States only 75 are required. In such circumstances production must inevitably be dearer, with a correspondingly restricted consumption. In reference, for example, to the coal crisis, it was pointed out to us that one essential article used in coal-getting costs 25 cents. here as against 16 cents in the States. If

the same proportion applies to every item of cost in mining operations it is easy to see the total effect on the cost of output.

On the other hand, many of our visitors have been struck by the excellence of British chemical plant in design and construction and by the tidiness and cleanliness of British works. "You build your plant to last a generation, and splendid plant it is," was one comment made to us; "we build plant just to last until something better is invented, and then we scrap it." It was gratifying to hear yet another opinion that industrial research in this country is more advanced than in the States—the contrary is the popular view—but that the American commercial leader is, perhaps, quicker in applying the results the moment there is a sporting chance of a financial return. Finally, our visitors, especially in going through some of the dyestuff works, were surprised at the freedom with which the processes were thrown open to inspection, and remarked that nowhere in America would such frankness have been exceeded. Here, again, another popular impression was reversed.

The whole visit is a reminder of how rapidly the idea of chemical engineering as a distinct branch of technology has advanced in recent years. To that admirably managed body, the Chemical Engineering Group, and the educational work it undertook, much of this advance is due. The recently established Institution of Chemical Engineers has carried the work a great stage farther. If progress proceeds as rapidly and on such sound lines for another few years chemical engineering promises to become as much an accepted profession as electrical or civil engineering.

No Superphosphate Duty

BEFORE the full text of the report of the committee appointed to inquire into the proposed duty on imported superphosphate was available, it was clear, from Sir P. Cunliffe-Lister's statement in Parliament, that the Government did not propose to take any action in this case. It now appears that, while the chairman of the committee (Sir Arthur Whinney) favours a duty of 7s. 6d. per ton, to run for two years, the remaining members (Sir Henry Rew and Mr. Arthur Hollins) hold that the applicants have failed to establish their claim. The result will cause no great surprise, in view of the strong opposition offered to the application on behalf of agricultural interests. The original demand was for a protective duty of £1 per ton, on the understanding that any increase in the home price of superphosphate should not exceed 10s. or bring the total price above 70s. per ton. It will be noticed that the chairman recommends a reduced duty of 7s. 6d., which might to some extent ease the British maker's position, but is not large enough to remove the inequality between British and foreign prices. On the other hand, it would increase the cost of superphosphate to agriculturists, who are certainly not in a position to bear any additional burdens, however small, and involve the risk of a sympathetic advance in the prices of other fertilisers, when the tendency is towards lower prices and a more liberal use. Everyone will sympathise with the British superphosphate makers, but in the circumstances one can quite understand the failure of the committee to agree in recommending the proposed duty.

Possibilities in By-Product Recovery

IT was only quite recently that we drew attention to the marked tendency exhibited in recent years for producers, particularly those who manufacture on a large scale, to launch out from their normal or staple lines and to take up the production of types of materials either entirely new or new so far as they themselves are concerned. In the past the manufacturer of primary or raw materials was usually content to hand on his first-stage products to someone else to complete the chain of operations leading to the final substances, but to-day there is increasing evidence of the determination on the part of producers to centralise all these processes and to make themselves as independent as possible of others. In our previous comments on this tendency to render distinct branches of the chemical industry more self-contained than heretofore, we quoted a number of instances in which progress has already been made, and, as bearing out our own views, it is interesting to find Mr. R. L. Robinson pointing in detail (in a recent address to coke-oven managers at Durham) to the undeveloped possibilities waiting to be exploited for the benefit of those associated with the manufacture of metallurgical coke.

By-product coking is, of course, one of our main key industries, and it is fully recognised that in its present restricted state it is far too dependent upon prevailing conditions in the metallurgical and engineering industries, a state of affairs which times such as the present serve to emphasise. It should, however, be possible to make use of resources which exist and to extend the number of products so as to include those which could be calculated to serve as valuable allies in the case of severe competition in the more general run of primary substances. With the coking industry the field is, of course, almost infinitely wide, but Mr. Robinson draws some valuable conclusions as to those products which hold out the greatest promise of successful exploitation. For instance, with naphthalene as a starting point it is a comparatively easy stage to get to phthalic anhydride by oxidation, this substance being a valuable intermediate in the production of dyes, especially in the important phthalein group. Again, judging from the degree of notoriety which they have obtained in Germany, tetrahydronaphthalene and decahydronaphthalene (more commonly known as tetralin and dekalin) should find a ready outlet in the paint and varnish industries as substitutes for turpentine, particularly when one bears in mind the fact that the world's output of turpentine is about 30 million gallons annually, and that about 75 per cent. of the whole comes from the United States. Moreover, their production should involve little in the way of technical difficulties or experiment, for it is, of course, known that in Germany a large-scale plant with a capacity of 120 tons per day has been in operation for some time at Rodleben.

In artificial resins (coumarones) and liquid fuels, such as cyclohexane, cyclohexanol, and alcohol, lie other possibilities capable of almost immediate application, all of which have been embarked on a prosperous career in Germany. So long ago as 1914 some 6,000 tons per annum of paracoumarone were being turned out in that country, and to-day the output is certainly double that amount. The great merit attaching to many of these products is, moreover, that

the demand is more or less consistent and not greatly influenced by the course of trade in our more fundamental industries. Truly, therefore, the coke-oven industry is faced with wonderful opportunities for levelling-up its trade curve, merely by adding variety to the products in which it is capable of dealing.

America and Methanol

WHILE synthetic methanol continues to occupy the centre of the chemical stage, there are indications that some of the statements circulated concerning its possible detrimental effect on long-standing industries have been more than tinged with exaggeration. For instance, rumours which have gained wide currency have forecast the ruin of the American wood distillation industry and have threatened the ethyl alcohol industry, as well as created a stir among the prohibitionists who have learnt with consternation that in its pure form methanol is non-toxic.

Undoubtedly the feat of the Badische undertaking is one of unusual importance and interest, but the case, so far as we have heard it, has scarcely been presented dispassionately. It is, therefore, refreshing to find in a bulletin just issued by the American Chemical Society a straightforward statement by Mr D. H. Killifer which should do much to palliate the fears of those who had persuaded themselves that the collapse of the ethyl alcohol industries was only a matter of time. It is not denied that the American wood distillation industry is faced with a potential danger, but Mr. Killifer is still of the opinion that the facts, as so far stated, should be accepted with great caution. We have been told that Germany has been exporting large quantities of methanol to America. Official statistics show that during the whole of last year only 48 gallons entered the country, but from February to May in the present year the situation underwent an extraordinary change, and no less than 225,000 gallons was imported. In view of the prevailing conditions in the wood distillation industry, the rumoured manufacturing cost of about 9d. a gallon for synthetic methanol in Germany assumes real importance, and although there is no definite assurance that this figure is correct or even nearly so, the American industry is in no way in a position to make drastic cuts in its prices. The only way, in fact, in which the situation lends itself to handling is by the imposition of heavy tariffs, and an application has already been made for an increase of 50 per cent. to the existing duty, while a further application has been made for a bar against the import of the material under the anti-dumping provisions.

So far as the ethyl alcohol industry is concerned the position seems clearer. Methanol has, of course, been heralded as a highly-efficient solvent, and it has been said that a sufficiently low price might result in its adoption where ethyl alcohol is now used. The fallacy of this supposed threat lies in the fact that ethyl alcohol is most largely produced from molasses, a by-product of the sugar industry, while by the new process methanol must be the primary, if not the sole, product of its own manufacture. Thus there are no secondary products which can bear some share of the cost of the process. On the other hand, the ethyl alcohol producers state that since their industry is based so largely on the by-product of another industry, they are in a position to meet sharp competition from a process that does not carry this advantage. This is an important and material sidelight on the whole matter which does not seem to have been previously considered.

German-American Dye Combine

THE chemical press of New York appears to be seriously perturbed by the recent formation of a dyestuff-selling organisation representing American and German interests. This alliance is regarded as a first step towards the restoration of the German colour industry to the position it occupied in the American market before the war. Already, it is reported, the arrangement includes two of the largest German dye-makers and two well-established American plants, while the selling staff represents what is described as "mellow experience" in the art of marketing German wares. Already equipped with "brains, money, and plant on both sides of the Atlantic," it is considered likely that the agreement will be enlarged presently to embrace three big German dyestuff manufacturing firms, four or five plants in the United States, and an experienced sales personnel with twenty years' knowledge of American market conditions. The prospect before the independent American dyestuff manufacturer of meeting this competitive group is described by *Drug and Chemical Markets* as "decidedly unpleasant." As it is due to the mutually destructive domestic competition which for some time has been proceeding among American makers, the policy for the future is clear. The American manufacturer must cease fighting his neighbour and combine with him for common protection; American producers must co-operate more closely and sacrifice a little for the common cause or, in the words of our contemporary, "call in the junk man."

Points from Our News Pages

Our Indian correspondent surveys the chemical activities in Madras, and particularly mentions the Government's action in encouraging and establishing industrial enterprise (p. 120).

Mr. W. P. Dreaper deplores the type of chemist produced by modern colleges (p. 122).

Activities of the American Chemical Engineers (p. 122).

A substantially increased output and a progressive reduction in costs were mentioned at the annual meeting of British Celanese, Ltd. (p. 123).

The Committee of Inquiry into the application for a duty on superphosphates has issued two reports. No steps are to be taken by the Government (p. 132).

Our London market report shows that the holiday season is reflected in business, but prices are maintained (p. 135).

The Scottish market is unsettled—due to the coal crisis (p. 138).

The Calendar

Aug. 26 to Sept 2	British Association for the Advancement of Science.	Southampton.
Oct. 4	Société de Chimie Industrielle: Fifth Annual Congress	Paris
Oct. 23	Engineers' Club: Annual Dinner.	Savoy Hotel, London

Chemical Industries of Madras

(From Our Indian Correspondent)

Madras is an important province in India whose resources for the development of chemical industries are immense, but are little utilised. The Government is doing something in its own way by pioneering enterprises which, when sufficiently successful, are handed over to private enterprise as a matter of policy.

Soap Manufacture

The Government owns a soap manufacturing factory at Calicut, where also apprentices are trained for work. The production last year was about 250 tons of all classes of soap. Owing to adverse trade conditions and mainly to the severe and increasing competition of cheap and colourable imitations, the enterprise showed a loss of about Rs. 10,000. The factory is now improved and is capable of turning out 1,000 tons of soap per annum, and with the larger output and the same overhead charges it will be possible to reduce the price of soap and so stimulate sales. There was a fair demand for Washwell and other household soaps, but as Washwell is comparatively expensive, it has been decided to manufacture a cheaper kind containing about 62 per cent. of fatty acids. Sales of soft soap and fish-oil rosin (insecticidal soap) are on the increase. Endeavours are being made to popularise the latter, which has been so successful in destroying insects and pests that attack various plants of economic importance. The manufacture of Deepa Brand Soap, which is used for cleaning metal articles and utensils of all kinds, has now been taken up and its sales are satisfactory.

The success or failure of soap manufacture depends largely upon whether it is possible to utilise the by-products derived from the process of manufacture. When soap is made by the boiling process, glycerin, which forms about 10 per cent. of the weight of the oil used, is set free. A glycerin plant has now been installed in the soap factory, which enables it to prepare 80 per cent. crude glycerin, but it has not been operated yet on a commercial scale. Provided a ready sale can be obtained for the glycerin produced, the cost of production of the soap should be reduced. A causticising plant for the production of caustic soda from soda ash has also been installed, but the results obtained from it have not been so far very encouraging, since caustic soda can at present be purchased at cheaper prices.

Experiments in New Industries

A considerable number of analyses of raw materials were made in the factory. Experiments were conducted on the extraction of sugar-cane wax from sugar-cane scum obtained from the sugar factories, and it is proposed shortly to undertake the manufacture of sugar-cane wax on an experimental scale. The question of the extraction of essential oils and perfumes from plants and herbs is also receiving attention.

The Government has also an ink-manufacturing factory which is showing good progress. Attempts are being made to improve the quality of the standard blue-black writing ink, blue-black record ink, blue-black fountain-pen ink, and scarlet ink manufactured in the factory. Experiments are in progress in the manufacture of concentrated ink for filling in cheques, copying inks, rubber stamping inks, and various coloured inks, many of which have proved successful. The question of manufacturing ink powders has been fully investigated, and it is found that ink powders of superior quality can be manufactured at prices which would permit of competition with the much inferior ink powders manufactured locally. The factory is now fully employed in complying with orders received from public bodies and the Government. It is under contemplation to undertake the manufacture of printer's ink, for which there is a considerable demand, while experiments with regard to the manufacture of cyclostyle and other varieties of ink are in progress.

At the Government glue factory, experimental work is in progress to improve the quality and finish of the standard glue manufactured. So far a satisfactory glue for fixing match heads has been evolved, but the experiments in regard to the manufacture of roller composition did not prove successful.

Investigations on a large scale have been also in progress in regard to the possibility of manufacturing malted foods. As the laboratory experiments have been encouraging, a Government pioneer factory has been started recently for the manufacture of malted foods. The investigation upon prickly pear has been completed, with the characterisations of the sugars obtained by acid hydrolysis; substituted hydrozines had been obtained for the purpose, and with their aid glucose, galactose, and arabinose were recognised. The question of the utilisation of Lantana as paper making materia! was investigated, and it was found that the stems of the shrub yielded a pulp which bleached and felted easily, but the fibres were hardly strong enough to be used alone and the pulp would only serve as a filling material to stronger fibres. Some experiments were also made in the preservation of rubber latex, but nothing superior to ammonia, the agent at present employed, was discovered.

As regards the match industry, the chief development to be recorded is that the South Indian Match Factory, Ltd., reached the stage of production during the year, and the matches manufactured by the factory appear to be of good quality and to compare favourably with the best imported brands. The factory is equipped with a complete set of automatic machinery of German manufacture, and is capable of turning out 100,000 boxes per day. In the initial stages this factory imported the necessary splints and veneer for boxes from Japan, but now the Industries Department has come to the assistance of the company and has explored the possibilities of utilising local timbers. A complete survey is yet to be completed.

Dyes and Tanning Stuffs

The investigations in regard to indigenous dyes and tanning stuffs were concerned with Tagarai seed (a fermentative agent in indigo dyeing), the employment of Kapila on silk, the dyeing of khaki, and the possibility of replacing indigo by synthetic dyes for the production of a particular black shade of blue in vogue in some districts of the Province.

The coconut oil industry is one of the most important industries of the Province. The dessication of coconut and its preparation for export and the preparation of coir and fibre have been under investigation. A special officer is being deputed to Ceylon to study the conditions there.

As regards minerals, a sample of asbestos discovered in the Cuddalore district was analysed and was found to be an exceptionally good and fine variety. The party was placed in touch with firms interested in the asbestos trade. Another sample of asbestos from the Anantpur district was also found to be good quality serpentine asbestos. The development of the cement industry, for which a large company had been formed, has been temporarily checked by reason of financial difficulties.

S. G. W.

Acid-Proof Earthenware

Some interesting information regarding "Ceratherm," an acid and heat-proof earthenware, has been issued by Guthrie and Co., St. James's Chambers, Accrington, Lancashire, in pamphlets describing their products. "Ceratherm" is incorporated in armoured centrifugal pumps and in various chemical apparatus, and it is claimed that this material is not glass-like and brittle as is ordinary earthenware. The head which these pumps will lift is from 50 to 150 ft. at one stage, at from 500 to 1,750 revolutions, and from 20 to 500 gallons per minute can be pumped. While the efficiency of metal pumps deteriorates after use with acids owing to the solvent action of these liquids, "Ceratherm" pumps claim to deal with weak and strong acids, whether hot or cold. Guthrie and Co. also make ceramic-lined dye vats and "Ceratherm" acid heaters, as well as "Acidstone." This is unbreakable and machinable, and has advantage over ebonite or rubber, both in its indifference to boiling temperatures and the action of corrosive chemicals, and in its adaptability to various shapes and sizes. It claims to withstand hydraulic tests of 500 lb. per sq. in. Agitators for mixing heavy sludge have been made of this stone, and propellers, sieves, rollers, etc., also, and it is used for hank and dye sticks and the sides of dyeing machines. Porcelain covered dye vats are made with iron outside and the tiles are fixed with a special jointing cement which, after boiling tests for eight hours on large scale operations, is said to show no attack and does not wash out. This cement has also been used effectively in paper and pulp works apparatus.

The Superphosphate Inquiry

Majority Against a Duty

THE Board of Trade this week issued a White Paper containing two reports by the members of the Committee appointed to inquire into and report upon the application made by the Fertiliser Manufacturers' Association, Ltd., for the imposition of a duty on superphosphate. Sir Arthur Whinney, the Chairman of the Committee, presents one report, while the other members (Sir Henry Rew and Mr. Arthur Hollins), are responsible for the other.

In his report the Chairman states the reasons for his opinion that the applicants have established their case for a duty. Foreign competition, he contends, can be met under existing circumstances by the imposition of a countervailing duty of 7s. 6d. per ton, and he suggests that such a duty should be imposed for two years. The other members of the Committee dissent from his views, and hold that, having regard to all the conditions, the applicants had failed to establish a claim to a duty.

The Committee state that the evidence of the opponents was directed to the effect on agriculture of a tariff on superphosphate, to the question of efficiency and economy in the industry, and to rebuttal of evidence given on behalf of the applicants. The applicants based their claim for some measure of safeguarding upon the abnormally large imports of superphosphate said to have occurred during recent years from Continental countries, more particularly Belgium, where manufacturers were alleged to have the advantage of a bounty consequent on a depreciated exchange, and of inferior conditions of remuneration of labour. With regard to the importance of the goods produced by the superphosphate industry, evidence was given indicating the importance of superphosphates to the agricultural industry in the production of barley and other grain, root crops and potatoes. It was indicated, however, that on certain classes of land superphosphate did not give altogether desirable results, and, further, that other fertilisers, such as basic slag, could at times be substituted.

The Chairman's Recommendations

The Chairman, in stating his conclusions, says :—

"On the whole I am inclined to the opinion that in view of the use of superphosphate for agricultural purposes, and in a lesser degree by reason of the volume of employment in the industry, the superphosphate industry may be regarded as an industry of substantial importance. I find on the evidence before me that foreign superphosphate is being imported into and retained for consumption in the United Kingdom in abnormal quantities. Seeing that foreign superphosphate is being offered for sale at prices ranging between £2 14s. and £3 3s. per ton, and that the cost of production of home-manufactured superphosphate is £3 8s. 8d. per ton (exclusive of profit), I find that imported superphosphate is being sold or offered for sale below the price at which superphosphate can be profitably produced in the United Kingdom.

I am of opinion that employment has not yet been seriously affected by foreign competition resulting from the abnormal importation of superphosphate, but I think it probable that, if present conditions arising from such foreign competition continue unabated, the British industry may be brought to a standstill, with a consequent increase in unemployment. On the other hand, the British manufacturers may be able to save the position by recapturing the export market and thus give a larger employment to labour.

I have arrived at the conclusion that unfair competition does arise in the case of imports of superphosphates from Belgium and France by reason of the depreciation of exchange operating so as to create an export bounty. Subsidies, bounties, or other artificial advantages: I am of opinion that no unfair competition (under these sub-headings) has been proved to arise. I am of opinion that unfair competion does not arise from any inferior conditions of employment of labour. Viewed as a whole, I am of opinion that, notwithstanding these disadvantages, there is no ground for finding that the industry is conducted otherwise than with reasonable efficiency and economy.

A review of the evidence available does not suggest that imposition of a duty on superphosphate would have, in itself, any seriously adverse effect, at least in the immediate future, on employment in the consuming industries. I am of opinion that a case for a duty has been established.

The unfair competition which I find to exist arises from the export bounty created by the depreciation of the Belgian and French currency. Such competition can in my opinion be met under existing circumstances by the imposition of a countervailing duty of 7s. 6d. per ton, and I suggest that such duty shall be imposed for a period of two years."

The Majority Report

The second report sets forth that Mr. Arthur Hollins and Sir Henry Rew regret that they are unable to sign the Chairman's report, in the preparation of a large part of which they collaborated and with much of which they agree. From the main conclusion, however, they dissent. They conclude by stating :—

"We are not satisfied that the competition of which the applicants complain arises from depreciation of currency operating so as to create an export bounty on superphosphates. It appears to us from the evidence laid before the Committee, that in Belgium, France, and the Netherlands, manufacturers of superphosphate have been alert in adapting their work and equipment to post-war conditions and by legitimate enterprise have lowered their costs of production and successfully developed an export trade. British manufacturers generally have been less alert, with the result that their foreign competitors have been able to enter both the home and overseas markets, and, in some degree, capture the trade. Many of the British makers have, somewhat tardily, awakened to the necessity of taking active measures to meet the new conditions. Already there appear to us to be signs that the severity of foreign competition is lessening, and we attribute this mainly to the fact that it has acted as a spur to the enterprise of the British makers. The manufacture of superphosphate originated in this country, and we see no reason to doubt that British manufacturers will in the future, as in the past, be able to dominate the home market and at the same time recapture a large part of the export trade which has slipped from them. We cannot but think that, under present conditions, the imposition of a duty would be more likely to act as a narcotic than a tonic on the superphosphate industry. However this may be, we have no hesitation in stating that, in our judgment, the existence of unfair competition caused by depreciation of the currency has not been proved."

Death of Mr. L. E. Vlies

THE death is announced of Mr. Leonard Ellerton Vlies, a prominent figure in the chemical industry of Manchester and district. Mr. Vlies was a leading expert in the manufacture and application of dyestuffs, and at the time of the outbreak of the war was a member of the firm of Claus and Co., Ltd., Clayton, Manchester. This firm was later amalgamated with Levinstein, Ltd., and finally merged into the British Dyestuffs Corporation, Ltd. Mr. Vlies was closely associated with the manufacture of the usual range of dyestuffs manufactured in Great Britain in pre-war days, and was a a pioneer during the war period in the development of vat dyestuffs. He was a member of the council of the Manchester Literary and Philosophical Society for a considerable number of years; a Fellow of the Institute of Chemistry, serving on its Council from 1917 to 1920, and he was secretary of the Manchester Section of the Society of Chemical Industry from 1913 to 1919. He was also a member of the Society of Dyers and Colourists and a Fellow of the Chemical Society.

Dyestuffs Administration

EVIDENCE was offered on behalf of the Federation of Calico Printers at the meeting of the Committee of Industry and Trade on Wednesday. On the dyestuffs question it was submitted that there was much room for improvement in the administration of the Dyestuffs (Import Regulation) Act. Special attention was called to the recent negotiations which had resulted in a reduction from 16d. to 10d. per pound in the price of British-made indigo. In this connection the comment made by Mr. H. Sutcliffe Smith, chairman of the Colour Users' Association, at the annual meeting of that body on June 30, was quoted. He had then said that there could be only two deductions from this enormous fall (from 16d. to 10d.) in price; either that the British makers had been taking an undue advantage of the protection afforded to them by the Dyestuffs (Import Regulation) Act, or that the new price of 10d. per pound was an uneconomic one.

American Chemical Engineers' Tour

Visits to Industrial Works

DURING their visit to Edinburgh last week the members of the American Institute of Chemical Engineers on tour in this country were entertained to luncheon by the Corporation. Bailie COUSTON, who presided, in proposing the toast of "Our Guests" confessed that until lately they were much in ignorance of what the profession of chemical engineer really was. This was scarcely to be wondered at, for as a distinct profession it was comparatively young in this country, although older in America. The study of chemical engineering in this country was such that in 1914, when our Government wanted a chemical engineer of outstanding ability and experience to erect larger scale plants for the manufacture of enormous quantities of high explosives, to get the best man it was found necessary to go to South Africa to bring over an American citizen, Mr. K. B. Quinan, who took charge of the whole chemical engineering in this country all through the war. (Applause.) In America the teaching of chemical engineering was in advance of that in this country, and this was scarcely to be wondered at, for in America with its great natural resources the field was immensely wider. It was, however, this country which, although not under the name of chemical engineering, was the pioneer in what he might call the adaptation of chemical and engineering knowledge to the large scale commercial manufacture of such substances as soda bleaching agents and by-products.

Dr. C. L. REESE, president of the American Institute, in replying, described Edinburgh as the most beautiful city in the world. He said that advisedly. He had travelled in Europe, America, and other countries, and knew of no city which aroused greater interest.

Professor HINCHLEY, London, who also responded, said that when he thought of Edinburgh he always thought of it as one of the great centres of intellectual activity and civic beauty. The Institution of Chemical Engineers had come into existence about two years ago, largely through the influence of the American Institute, and one thing they were concerned about was the education of chemical engineers, not in small but in large numbers, for the natural and rational head of every industrial corporation or factory involved in technical work was a chemical engineer. The Old Country was threatened on all sides, and the threatening came not from force but from brains, and they had to realise that brawn was not so important as brain. (Applause.)

Through the United Alkali Works

On Saturday, July 25, the American chemical engineers, with their British colleagues, were the guests of the United Alkali Co. at Widnes. Prior to luncheon in the new Recreation Hall, they were escorted round the Pilkington-Sullivan Works, where they saw the modernised plant for the manufacture of mechanical bleach and the new electric power station at West Bank Dock. Dr. Conroy was accompanied by Mr. Horace Muspratt and Captain Bain, and among the visitors were Dr. Reese, Sir Arthur Duckham, and Mr. W. J. Woolcock, president of the Society of Chemical Industry.

Dr. CONROY, proposing the toast of "The American Visitors," recalled with satisfaction his visit to America in 1904, where he had made many friends. He had been well received everywhere and he was glad of the opportunity to entertain them on this side as guests of the United Alkali Co. The absence of Sir Max Muspratt and Dr. Clayton, M.P., was regretted, because it was the first function of the kind to be held in the hall since the opening. He reminded those present that Widnes had been, and still continued to be, the home and centre of the chemical industry. Years ago they exported considerable quantities of alkali to America, but now that country was making considerable strides in the production of chlorine. That was the beginning of a change in the chemical trade, and big changes were likely to take place in the future. The chemical engineer had made a big position for himself in the chemical world, and America had done a lot to further their claims.

Dr. REESE said they had been accorded a wonderful reception, and appreciated very much what they saw.

Captain BAIN said that in this little country of ours the social structure was so packed that very little at the present moment would upset it. During the next few days they would know whether British industry was going to be plunged into a chasm of unutterable blackness or not.

Sir ARTHUR DUCKHAM said the visit had been very instructive, and they must all realise that the real future of the industry rested with the chemical engineer. If they could imagine a really fine engineer with a knowledge of chemistry, who could talk to the research chemist and give that chemist the assistance he wanted, that was the man of the future for the administration of works. The job of the society was to try and develop men to suit that purpose.

Mr. WOOLCOCK said the society was really born in Widnes. The United Alkali Co. had this distinction quite apart from the ordinary genuine first-class business—they had something just a little outside the big business idea, a power of vision which was not common among British manufacturers. This would have to be developed to a very great extent if we were going to hold our own in the markets of the world.

During their stay in London the party inspected Wembley, under the guidance of Mr. Woolcock, were shown over the Houses of Parliament by Dr. G. C. Clayton, M.P., attended a reception at Leighton House given by Sir Arthur and Lady Duckham (at which Earl Balfour was present), and were shown at Abbey House, by Sir Robert Hadfield, the metallurgical exhibits prepared by him for the 250th anniversary of the founding of the Royal Observatory, Greenwich.

Benzene and the Colleges

To the Editor of THE CHEMICAL AGE.

SIR,—In your last issue Professor Armstrong once more complains about the type of chemist turned out by our colleges. He judges the system by its results and, so far as this is correct, has undoubtedly much argument to play with.

Things seem to be much the same on the other side of the Atlantic, as Stephen Leacock complains that their system "puts a premium on painstaking dullness, and breaks down genius, inspiration, and originality in the grinding routine of the college treadmill." Undoubtedly the snag in our teaching system is its professionalism, which always acts as a blight on anything, be it football or chemistry. Under its influence a teacher-taught teacher follows teacher, and development and progress is slowed down to zero or thereabouts. Professor Armstrong is correct when he states that modern college research is in the main farcical. Little can be done with it but wrap it up in wood-pulp and store it away. It is old-fashioned before it sees the light.

I have suggested that it would be better to teach the *principles* of research in class, the students in groups repeating selected examples of original investigations as these were carried out by Faraday and his successors. In this way they would gain first-hand information of the ideas and difficulties met with in real research. But I have not succeeded in getting any college to take up this method of teaching, and the same old round of imitative research or even no research at all goes on, and student after student leaves the college with practically no idea as to the real nature of research, for have they not been fed mainly on college text-books "which are little more than collections of material out of which in the hands of a properly gifted person a book might be made," and lectures repeated year by year without material change by tired, and not very original, teachers?

Finally, the students are herded into examination rooms, given degrees, and pushed out into an unsympathetic world to learn in a school of experience which bears little relation to the university in which they were trained. Thus we have a completed picture which Professor Armstrong contemplates with dismay and foreboding.

If he will swat the fly of professionalism, he will hit the mark first time, and future generations of chemists will rise and call him blessed. The position certainly calls for a thorough examination, as it is no good blaming the students. A surgical operation is necessary which will cut deep into the present system and thereby reduce the self-satisfaction of our teachers, which is sometimes difficult to contemplate without scorn.

Professor Armstrong complains that the right kind of student is not attracted to our chemical departments. Why should he be under present conditions?—Yours, etc.,

July 27. W. P. DREAPER.

British Celanese

Review of a Year of General Progress

At the annual general meeting of British Celanese, Ltd., held in London on Thursday, July 23, the Chairman (Major-General G. P. Dawnay) was able to point to an improved position in nearly every department and to predict, in spite of industrial troubles, the effect of the silk duties, and other handicaps, a future of continued expansion.

Increased Profit and Growing Business

Comparatively, he said, the trading profit increase of £307,000 in relation to the improvement in the balance to profit and loss by £267,000 indicated a turn of the tide which was something more than satisfactory, for while the profit on the trading account proper was increased by 300 per cent., over 80 per cent. of that increase went to net profit. That relation was remarkably encouraging.

His predecessor last year told them that the period his speech dealt with was a period of transition, during which the company moved from a chief dependence on cord product to the establishment of yarn as their basic product, while at the same time setting up installations for the production of circular knitted fabric, and for other knitted and woven fabrics. The policy so outlined had very fully justified itself. Their sales of cord, a product specially vulnerable to Continental competition, now represented, owing to the expansion of other branches, but a small proportion of the total business. Their yarn sales had grown very substantially and satisfactorily. The output had been increased correspondingly to a level which was very considerably higher than any before attained. This had enabled the company to branch out in various directions in response to the increased demand.

Their business in fabrics had also grown important, and was still growing. The output of the circular knitted fabric plant, which was being increased at the date of the last meeting, was doubled during the period under review, and had since been further increased. It had proved itself a valuable part of their business, bearing out the forecast made last year. The " Celanese " Tricot which it produced was in much demand and had found a ready sale; it was highly appreciated by the trade and by consumers. The establishment of this department had proved an important addition to their profit-earning capacity. The effect was twofold. A department had been established which earned satisfactory profits itself, while the demand for its output promoted the expansion of the business in yarn, and appreciation of the value of " Celanese " generally.

New Products

The year with which he was dealing had also been a period of further transition. Great progress had been made in the development of other knitted fabrics, particularly in warp knitted fabric. In this fabric their factory was turning out a product which he was confident would become as valuable a branch of the business as, perhaps even more valuable than, the " Celanese " Tricot, and they were gradually expanding its production and sale. The product had been extremely well received. It had a special advantage in that it was incapable of laddering—though there had been remarkably few complaints on this score in respect of the Tricot fabric itself; and, further, a new Tricot had now been produced which was also non-laddering. The warp knitted fabric was adapted for garments manufactured on a large scale and of wide and general consumption, and it would become a very valuable and reliable item of output.

Good progress had been made with weaving plant. A large number of woven fabrics had been produced and had met a reception from the trade which justified confidence in the eventual development of this branch of the business also. As a profit-earner, and as an element of stability, he had every confidence in the future of the weaving department as a very valuable adjunct. In the last report the commodity known as " Celfect," a mixture of their silk and cotton, was mentioned. The sales of this product had made considerable progress. The finished articles made from it found an easy and increasing market, owing to appreciation of their quality, which surpassed that of the competitive articles in various respects. With respect to the " Celastoid " and dope departments, they were not aiming at present at the expansion of these branches, but both the " Celastoid " and dope branches were maintained on a small scale and returned a small but satisfactory profit. Finally, they were gradually widening the sphere of their activities in various directions, with the aim of establishing production and sales on as broad a basis and as stable a foundation as possible. Their factory had been well and properly maintained. A substantially increased output had been developed, side by side with a progressive reduction in costs, especially in the more advanced processes of manufacture, but also, of course, owing to the increased production. As regards their trading and profit-earning capacity, the progress made during the year under review seemed to justify what his predecessor said at the last meeting. Moreover, the further progress made since the beginning of the present financial year was also such as to inspire confidence.

The elections to the board of Major-General Dawnay and Mr. R. A. Murray were confirmed, and the retiring directors (Mr. Alexander Clavel and Sir A. Trevor Dawson) were re-elected. The auditors (Thomson, McLintock and Co.) were reappointed.

Methyl Alcohol from Methane

Some Interesting American Processes

The synthetic manufacture of methyl alcohol from methane is the subject of an interesting article reviewing the present situation which Dr. J. H. Frydlender contributes to the current issue of the *Revue des Produits Chimiques*, and among the processes described there are several patented by American inventors.

The Curme Process

In the method adopted by George O. Curme (U.S. Pat. 1,422,838, 1920) natural gas is taken as the starting point from which pure methane is isolated by liquefaction.

The methane added is from 5-30 per cent. of the amount of chlorine, according to conditions, the proportions varying with the chlorinated product which is primarily wanted. The reaction mixture passes into a chamber, which is charged with heated carbon prepared by Chaney's method. The catalyst must, like the gases, be completely dry, and in these conditions the whole series of operations can be carried out in steel or iron apparatus.

The resulting gas contains a large proportion of hydrochloric acid, besides methane and methyl chlorides, and runs through in a closed cycle in which the greater part of the chloroform and carbon tetrachloride is first condensed by external cooling with water. The rest is then compressed at several atmospheres pressure and separated from the methane by fractional liquefaction, which is easily carried out owing to the considerable difference in the boiling points of the methane and that of the other constituents. The liquefied mixture of gases is fractionated and rendered pure successively from hydrochloric gas (−80° C.), methyl chloride, methylene chloride and traces of chloroform and carbon tetrachloride. The gaseous hydrochloric acid can either be absorbed in water or liquefied and put into steel cylinders. The methane recovered enters the cycle again after a sufficient quantity of fresh methane and chlorine has been added to it.

Photochemical Catalysis

W. O. Snelling (U.S. Pat. 1,271,790, 1,285,823, 1,420,340) employs an apparatus for the photochemical catalysis of chlorination. Two different principles are taken as the starting points. An arrangement is used for submitting the reaction mixture to the effect of graduated light. The reaction chamber is divided by partitions, which are permeable to the light, and which cause the mixture to travel backwards and forwards across the chamber as it approaches the source of light. In a similar apparatus but with two chambers the gas can be cooled before passing from one cell to the next, and the temperature is thus better able to be controlled. By regulating the intensity of the light in the reaction chamber and supplying a great excess of methane the chlorination can be carried out in such a way that the formation of methyl chloride predominates. The reaction products are readily condensed and withdrawn.

In another apparatus a different principle is adopted to arrive at the same result. The chlorine and methane are introduced into large reaction bell jars and exposed to a very violent light, the fear of explosion being avoided by projecting the gases against the walls of the chamber, which creates eddies and cools them by this means.

Reviews

ORGANIC DERIVATIVES OF ANTIMONY. By Walter G. Christiansen. (American Chemical Society Monograph Series.) New York: Chemical Catalog Co., Inc. Pp. 230. $4.00.

The appearance of this book, one of the admirable monographs of the American Chemical Society, is singularly appropriate, seeing that, as recently as last May an International Conference on Sleeping Sickness was held in London, under the presidency of the Under-Secretary of State for the Colonies. The connection is not far to seek. The antimonials are of special value in the treatment of that deadly scourge which in 1901-1906 was responsible, in the districts of Equatorial Africa affected, for no fewer than 200,000 deaths amongst a population estimated at 300,000. In the volume under review, Dr. George C. Shattuck has contributed a valuable chapter to Mr. Christiansen's book, entitled "Antimonials as Therapeutic Agents," and shows that recent research has established the value of some of the organic compounds in the treatment of diseases of protozoan origin, and their almost specific virtue in combating the *Trypanosomes* and *Leishmania* which are responsible, respectively, for sleeping sickness, and Kala-azar, and the *Schistosoma* which take, annually, a deadly toll in Egypt, in China, and in parts of South Africa. In the treatment of diseases such as these, and in leprosy the antimony derivatives have proved their worth; arsenicals, and mercury compounds, so valuable in other diseases, have failed hitherto to prove remediable in those enumerated.

Mr. Christiansen's present volume may be regarded as a companion to the monographs on the "Organic Compounds of Mercury," and "Organic Arsenical Compounds" by F. C. Whitmore, and by Raiziss and Gavron respectively, and follows the plan of those books. After a brief historical review the author deals in detail with the aliphatic antimonials, the aromatic stibines, and the antimonyl compounds. The chapter by Dr. Shattuck is interpolated between Part I and Part II of the book, and the parable of the antimonyl compounds is broken in its natural sequence, which is perhaps a pity. Trivalent antimony and pentavalent antimony compounds are dealt with in Chapters VII and VIII, and the concluding Chapter X is devoted to analysis. The methods given in this chapter are thoroughly up-to-date.

Each chapter is logically arranged, the compounds being considered uniformly under the sub-heads "preparation" and "properties." Numerous formulæ of the graphic variety are given, and, for the most part, the constitution of the compounds may be taken as corresponding with the classical views, although these are empirical rather than deductive. Chemists in charge of the laboratories of manufacturers of fine pharmaceutical preparations, and their assistants will find this work, which is well printed and produced, and commendably free from misprints, of the greatest value to them in their work, and the author's task of wading through contemporary literature and discriminatingly selecting the best has been well and faithfully discharged.

L. P. S.

A TREATISE ON PHYSICAL CHEMISTRY—A CO-OPERATIVE EFFORT BY A GROUP OF PHYSICAL CHEMISTS, edited by Hugh S. Taylor, D.Sc. 2 vols. London: Macmillan and Co. Pp. 1,440. 50s.

Dr. Taylor is most warmly to be congratulated on having edited a treatise that will very surely withstand the test of teaching experience. To have secured the co-operation of such distinguished contributors is a notable achievement, but to have produced these volumes is a triumph of editorial art. The chapters cover the whole gamut of modern physical chemistry from the theoretical rather than the descriptive aspect, and if at times the reader be tempted to conceive the treatment an exercise in abstruse mathematics, he should remember that to attempt modern physical chemistry without a thorough knowledge of higher mathematics is not only to court disaster, but to wed it.

In so much advanced work of to-day involving the fundamental nature of matter, theory outstrips experiment, and speculative reasoning supplants knowledge: a true philosopher will recollect the dictum of Aquinas: "The summit of our knowledge is not reason but understanding," and the above volumes place it beyond doubt that in physical chemistry, certainly, the essential understanding is still afar off. In them the reader will encounter many divergent opinions, but such opposing views (with one possible exception) are expressed with unfailing courtesy, and always with clarity; it really is most refreshing amidst prevailing pontifical creeds to meet the statement that the whole quantum theory may be "a magnificent piece of self-deception produced by a scientific imagination," and its application "more or less of a cut and dry process" (p. 1,188).

It would be almost invidious to distinguish between the relative merits of different chapters: to a certain extent they betray the normal characteristic of a composite work—unevenness. But we might be permitted to mention as of peculiar interest those on the Quantum theory, and the Third Law of Thermodynamics, whilst the chapters on Electrochemistry (x, xi, xii, and xiii) form an excellent treatise on the subject. In particular, Prof. Partington, who contributes chapter xi, deserves everyone's gratitude for a most exhaustive and admirable bibliography containing some 2,000 references.

The printing of the whole work is excellent, misprints are exceedingly few, and the fact that the contributors are both English and American is not unduly obtrusive, though we did not expect to find *sulfur* and *sulphuric* within a few lines of each other (p. 215). Occasionally statements are made which might seem to justify comment—e.g., "all real processes are irreversible" (p. 63) seems to be more an arbitrary definition of *real* than an exposition of general fact, whilst in a book of this nature it is somewhat surprising that Eotvös' equation is simply stated on p. 127 instead of being derived. The index, too, might be improved: as an example at random, the vexed question of monomolecular reactions is not mentioned, though it is excellently treated in the text. A few minor errors have also been noted, but they do not in any way obscure the argument for an intelligent reader. Perhaps we may be pardoned for expressing the hope that in a subsequent edition the treatment of "corresponding states" on pp. 116, 117, may be further developed, and that space may be found for an expansion of chapter xx on Colloid Chemistry.

Frankly, the work is one we should hardly prescribe for a beginner: an initiate should obtain his groundwork elsewhere, but having acquired it, he could not do better than study these two volumes, which we commend to him as amongst the best we have seen. We venture the opinion that any chemist who is enthusiatic concerning his work will be the poorer for not having read them.

D. IVOR JAMES.

MONEY AND MINES. By Hugh F. Marriott, M.I.M.M London: Ernest Benn, Ltd. Pp. 270. 15s.

This volume has been written primarily for investors in undertakings engaged in working mineral deposits, to enable them to exercise a more intelligent supervision of their own interests, and is designed to give them a fuller knowledge of mining and the management of mining companies. The author is a past President of the Institute of Mining and Metallurgy, and Governor of the Imperial Mineral Resources Bureau, and has a unique experience of mining in all quarters of the British Empire.

The book is divided into three parts, dealing with the administration, organisation and economics of precious and non-ferrous metal mines, and is intended to give the investor an insight into the practical working of these undertakings, particularly in their economic aspect. Mr. Marriott begins by devoting four chapters to a study of directors, their status, their relations with the share market and the public, and in the outspoken style which characterises the whole book, the author makes some very pronounced statements. His description of what "usually" happens at meetings of the directors of a company, who sit round "looking either bored or perplexed," is likely to meet with much opposition, which will be heightened when he continues that "if one of the less influential directors were inclined to take an intelligent interest in the company's affairs, he knows that to ask questions . . . is to be voted a nuisance, and that at the first convenient opportunity he would be dropped from the board."

While Mr. Marriott's authority as a mining engineer is undoubted, his views would be more convincing if his estimate of those who have charge of the direction of this industry were more balanced.

J. A. B.

LE PRINCIPE DE SYMETRIE ET SES APPLICATIONS. By F. M. Jaeger. Translated by P. Gérald and J. Chevrier. Paris: Gauthier-Villars et Cie, 1925. Pp. xv, 417. 55fr.

The discoveries of J. J. Thompson, W. H. Bragg, W. L. Bragg, and Aston necessitate the reconsideration of facts and theories covering the whole field of chemistry; it becomes imperative to find some new centre round which our present-day knowledge could be grouped. The idea of symmetry in nature dates back at least to the Greek philosophers or earlier, but its application has become very difficult now that it is known that elements are complex worlds not unlike our planetary system. Therefore, this modestly sounding book, which is a translation of an English volume published in Holland during the war, is really a most ambitious attempt to line up experimental data in a single plane. As might be expected, a good deal of space is devoted to crystallography, the treatment of which is made more pleasant by combining it with the morphology of plants. This is naturally followed by the study of the atomic structure of crystalline compounds. The remainder of the volume is devoted mainly to work on the asymmetric carbon atom and contains much useful matter which has not hitherto been collectively published. It is provided with a comprehensive index. On the whole, the book is a useful collection of recent classified information on the structure of chemical compounds.

S. P. S.

PHYSICAL CHEMISTRY, ITS BEARING ON BIOLOGY AND MEDICINE, 3rd Edition. By JAMES C. PHILIP. London: Edward Arnold and Co. 8s. 6d.

The gradual encroachment of physical chemistry into the region of biology necessitated the writing of this book some years ago, and its merited success is marked by the appearance of the third edition. The aim of the book is simplicity in exposition and construction, the chapters being well arranged so that the subject matter on pure physical chemistry is followed by its application and utility in biology and physiology. Thus the chapter on absorption of gases by liquids contains a section on the absorption of oxygen by the plasma and the blood, electrolytic dissociation is applied to the conductivity of physiological fluids, and the biological applications of osmosis and its allied effects are discussed very fully, and new matter introduced concerning plasmolysis and permeability. It is in the chapters on "Colloids" and "Adsorption" that the book excels, and it is here that the more obvious applications of Physico-Chemical principles are to be found, as in the Danysz phenomenon, the agglutination of bacteria and the adsorption of proteins. The other chapters deal with chemical equilibrium, the velocity of chemical reaction and a final chapter on electromotive force, which includes a valuable section on hydrogen ion concentration and the use of "buffer" or "regulator" mixtures.

Not the least important feature of the book are the numerous and carefully chosen references to the original papers and to larger works for those who wish to extend their knowledge in some particular direction. The text is clear and the diagrams though few in number are good, but the student who is not well acquainted with physics and chemistry will find some difficulty in negotiating parts of the book which suffer from over-compression and which would be improved by the introduction of a few explanatory diagrams.

J. S. L.

MODERN INORGANIC CHEMISTRY. By J. W. Mellor, D.Sc. London: Longmans, Green and Co. Pp. 1,103. 12s. 6d.

A new edition of this text-book has recently been issued and will be welcomed by all teachers of inorganic chemistry. The text has been entirely re-set and many additions have been made, but although this volume has been increased by nearly 200 pages, the price remains the same. Possibly it is the best text-book on this subject at the price.

In the preface of this book, Dr. Mellor summarises in a sentence the point of view from which he approaches the subject. "A teacher will try his best to instil the maximum amount of scientific method into the facts, remembering that the student gets more lasting benefit from the method than from the facts *per se*." Thus, when introducing the fundamental laws of chemistry, the author does not label them "Law I, Law II," etc., and merely state them to be memorised in formal terms, as is all too usual in elementary text-books. Instead, he leads up by a discussion to the law, which then follows on as the logical statement containing the facts under consideration, so that the student cannot fail to remember it.

The book contains several chapters on physical chemistry, which are suitably included among those dealing with the elements and their compounds. Considerable space is devoted to the metals, while methods of preparing substances and diagrams of the apparatus used ensure that the treatment of facts is both thorough and interesting.

Appropriate quotations begin many of the chapters and bear out Dr. Mellor's method of treating the subject. The classification of the elements, for instance, is prefaced by the following statements. "The primary object of classification is to arrange the facts so that we can acquire the greatest possible command over them with the least possible effort." This does not imply that the student does not have to learn facts; rather he has to do so efficiently, and this book is designed to show him how to do it. The concluding words of the text are quoted from Sherlock Holmes. "It is a mistake to think that this little room (the brain) has elastic walls and can extend to any extent . . . it is of the utmost importance not to have useless facts elbowing out the useful ones."

J. A. B.

INDUSTRIAL OWNERSHIP: ITS ECONOMIC AND SOCIAL SIGNIFICANCE. By Robert S. Brookings. New York: The Macmillan Company. $1.25.

All too little is known on this side of the Atlantic of the biggest of the world's revolutions which have taken place since the war—not in Russia but in America. The strife and turmoil in Europe has driven the American investor to turn his attention exclusively to his home industries, with the result that there has been for ten years past a public interest in industrial investment which has never been equalled in the history of the world. The peculiar thing about this movement, is the fact that the investments have been made so largely by the working classes themselves, a peculiarity which can be explained only by the fact that it is American. Mr. H. A. L. Fisher, after his recent trip, gave figures showing tens of millions of American bondholders, and Mr. Brookings, in this interesting little book, gives an amount of detail which should be studied closely. For instance, there is an analysis of the owners of the shares in the Bell Telephone Co., classified by occupations, and the number of shares held. The European rubs his eyes to make sure of the type when he finds that 207 blacksmiths, 585 barbers, 498 domestics, and 668 hotel servants figure on a list which contains only 24 persons who classify themselves as capitalists.

NON-METALLIC MINERALS. By R. B. Ladoo. New York: McGraw-Hill Book Co., Inc. Pp. 686. 30s.

This book deals in a comprehensive way with the occurrence, preparation, and utilisation of non-metallic minerals, and covers primarily those of industrial importance. Even to-day the efficient production and utilisation of many minerals has hardly started, in spite of the fact that in the United States alone the value of the annual production of the non-metallic minerals—excluding coal, petroleum and natural gas—is estimated to be greater than that of the metals. Probably one of the obstacles to progress in the technological development of this field has been the lack of summarised information on the present state of the industries involved, and this book therefore satisfies a want. The author is general manager of the Southern Minerals Corporation of America, and has used his technical knowledge to the best advantage in this work.

While much of the material applies chiefly to deposits and methods in the United States, some attention is given to world conditions. Thus, there are numerous tables of statistics showing the production, sale, etc., of the principal minerals in every country where they occur to any extent, as well as diagrammatic charts which summarise the various stages in the manufacture of mineral products. The non-metallic minerals are treated in alphabetical order, enabling ready reference to be made, and there is a useful bibliography at the end of each chapter. This excellent volume should be of much assistance to all who produce or use the non-metallic minerals in any way.

Research and Industry

Suggestions by Science Guild Committee

THE British Science Guild have published a report, by the Research and Inventions Committee of the Guild, on the present position with regard to the supply of trained scientific research workers, and their utilisation in industry.

The committee find that, comparing the year 1923-24 with the year 1913-14, the number of full-time students in science at the British universities shows an increase of 60 per cent., while the number of bachelor degrees obtained in science has more than trebled. Over the same period, the number of full-time post-graduate students engaged in scientific research has increased to more than four times the 1913-14 figure. The Department of Scientific and Industrial Research, the committee observe, have afforded great assistance to research students in training, but, except in one or two instances, the Research Associations of the department do not appear to be very extensively developed.

The funds at the disposal of the department are large, but in view of the sums annually spent on scientific research in the United States and our general public expenditure, they cannot, in the opinion of the committee, be described as adequate to the great needs of our industries. It appears from inquiries that there is considerable unemployment among recently trained scientific research workers.

The committee conclude that the value of scientific research to industry is now widely recognised; but that the part that industry itself can play in maintaining an adequate supply of research workers, and in promoting or supporting scientific research, is not so well understood. They suggest that the Government could offer considerable inducement to commercial firms to support research by permitting sums devoted to this purpose to be treated as trade expenses for the purpose of assessment for taxation. They consider it imperative that, before more men and women are encouraged to undertake scientific research training, the demand for them should first be assured. The committee do not look to the greater industrial concerns—many of which already realise to the full the value of scientific research—to provide a solution of the present difficulty, but rather to the hundreds of smaller firms whose industrial research associations, if fully developed, could utilise many more scientific research workers; to the benefit, the committee submit, not only of each particular industry, but of the industry of the country as a whole.

The committee further suggest an extension of the method adopted by the various research committees and co-ordinating boards of the Department of Scientific and Industrial Research, and by the Ministry of Agriculture and other Departments; an inquiry with a view to the establishment of an organisation on the lines of the "A. D. Little" Laboratories in the United States; and also an extension of the scheme at present in operation in Bristol University, under which an industrial firm endows for two years a research student who works on a special line of investigation in the laboratories. In a memorandum appended to the report the committee strongly recommend the formation of a permanent expert advisory committee on industrial inventions, the functions of which would be (1) to examine the claims of inventions and to decide which are of probable industrial value; and (2) to arrange for the semi-large scale, or complete commercial trial, of inventions passed by the committee.

International Constants

THE fifth volume of the Annual Tables of Constants and Numerical Data has been published jointly by the Cambridge University Press, Gauthier-Villars and Co., Paris, and the University of Chicago Press. The book is issued under the auspices of an international committee, to which Dr. Charles Marie, of 9, Rue de Bagneaux, Paris VI, is the general secretary. It contains chemical, physical and technological data, which are printed under headings in four languages—English, French, German, and Italian. The tables of international constants are not limited to data collected in a few countries only, but have been compiled from information sent from Africa, Australia, Canada, Chili, and Japan, as well as from nearly every country in Europe. When the present unsettled conditions of the world are considered, the compiling of such data is no easy task, and the editors are to be congratulated on the resulting volume.

Chemical Industry in Italy

Potash from Leucite

THE possibility of utilising the vast beds of leucite in Italy has recently entered on the stage of practical realisation. The Vulcania Company, founded in 1923, has acquired extensive beds of leucite in the volcanic area of Monte Cimino, about 40 miles north of Rome. For the separation of the potash salts contained in this leucite it has erected works which can handle 60,000 tons of rock a year, and is now building a factory with an initial annual output of 3,000 tons of nitrate of potash obtained by a process patented by Dr. Antonio Meerschmit. This consists in heating the pulverised leucite rock mixed with a solution of sodium salt, to 200° C., thus converting it into a silicate of aluminium and of sodium, while all the potash enters into solution as a nitrate. When the concentrated solution cools, about 90 per cent. of the nitrate of potash content separates in crystals, while the liquid solution, to which a further quantity of sodium nitrate and crushed leucite is added, is again subjected to the process. By this means potassic rock (leucite) can be made to yield valuable fertilisers obtained by mixing potassic phosphates with this nitrate of potash.

Utilisation of Lava

Another process for utilising leucite rock is that patented after long years of experimental work, by Dr. Gian Alberto Blanc, and used by the Società Italiana Potassa, which has erected works in the province of Caserta to utilise the leucite lava of Roccamonfina. Dr. Blanc's process makes it possible to split leucite into its three constituents: alumina, potash, and silica, securing all three in serviceable form. The alumina, indeed, is obtained so free from iron and silica that it can be used without further treatment for the manufacture of aluminium. The leucite is enriched by a new system of separation based on the magnetic properties of the particles of lavic gangue which must be eliminated. With this end in view the leucite rock is reduced to a sand consisting of fragments of non-magnetic leucite crystals and of magnetic basaltic gangue. This sand is submitted to a process under which it yields leucite granules containing 18 per cent. of K_2O, 23 per cent. of Al_2O_3, 55 per cent. of SiO_2.

These leucite granules are then treated with strong solutions of hydrochloric or nitric acid, and at the conclusion of the process pure chloride of potash, hydrate of aluminium practically free from iron and silicates and readily soluble in sulphuric acid for the production of sulphate of aluminium, and pure silicate suited to several important industrial uses, are obtained.

Oils and Fats Research

A recent issue of *L'Industria degli Olii e dei Grassi* gives an interesting account of the work of the Experimental Institute for Oils and Fats at Milan. In 1923-4 the Institute took part in various chemical congresses, e.g., at Rome in June, 1923, at Paris in October, 1923, at Milan in April, 1924, also at the geological congress at Placentia. Work done at the Institute and discussed at these various meetings included glycerin research and estimation of the T.M.G. (trimethyleneglycol) content; standardisation of analytical methods for oils and fats, in collaboration with foreign chemists; and improved methods for the analysis of butter and detection of fatty acids.

A considerable amount of work has also been done on mineral oils for purposes of fuel and lubrication on behalf of the railways and Italian Air Ministry. Examination of transformer oils was another interesting study in conjunction with American workers representing the Tide Water Co. and the Standard Oil Co. These transformer oils have greatly improved in quality according to samples analysed at the Institute, and very few show any appreciable deposit after prolonged heating—the test usually applied.

The Institute has supervised the establishment of a new oil mill in Sardinia, probably for olive oil, a glycerin recovery plant in Southern Italy, a soap-drying plant in Naples, and has undertaken experiments with various kinds of bleaching earths. The testing and analytical work of the Institute has grown very largely during 1924, the total number of samples received for examination in that year being 3,572. A large amount of technical instruction is also given, and a fairly considerable school has been organised for chemical students and others desiring to specialise in oils and fats research.

Gravity Recorders for Liquids

THE advantages of automatic recorders that make a continuous record of the gravity of the liquid passing through them are now generally recognised. These are well illustrated in the case of the Bailey Gravity Recorder, some particulars of which have been supplied to us. This is made in two designs, both operating on exactly the same principle, but intended for use under different operating conditions. The one design, known as Type S3, is for use where pressures do not exceed 50 lb. per sq. in., and the liquid is free from sediment that is liable to settle and clog the casing. The rate of flow of the sample through this type should be between one gallon and 10 gallons per minute. The other design, known as Type S5, is designed for working pressures up to 200 lb. per sq. in. The casing is constructed with a conical bottom without places liable to detain solid material. It may be used for liquids containing solids, such as clay suspensions, and solutions containing pulp fibre, crystals, etc. The allowable rate of flow for the sample is between two gallons and fifty gallons per minute.

The magnetic principle is used for the transmission of the motion of the displacer to the pen. A permanent magnet is mounted on the pendulum rod and moves in an arc in front of the non-magnetic plate. The armature is supported from a beam mounted on pivot points, with its axis in line with the displacer beam, so that it moves in the same path as the magnet. Both the magnet and the armature are segments of a circle, thus giving the maximum power for the operation of the pen which is far in excess of the friction. The recorder pen has a 4¼ in. travel on a 12 in. circular chart. The full pen motion can be secured with a total change of 0·008 specific gravity or 2° Brix., and an accuracy of 1 per cent. This corresponds to an accuracy of 0·00008 specific gravity or 0·02 per cent. sugar, or 0·02° Brix. The recorders can be made to cover any wider ranges in specific gravity desired, such as 0·80 to 1·00, 1·00 to 1·50, etc., this being brought about by varying the pendulum weight or its position on the pendulum rod. The charts can be graduated to read directly in specific gravity, degrees Baume, degrees Brix. or per cent. sugar, per cent. acid, per cent. alcohol, etc.

The materials used in the construction of either type of gravity recorder are selected according to the chemical activity of the liquid for which it is designed. For most petroleum oils the casing is made of cast iron; the displacers are made of welded steel and charged with oil of the same gravity as indicated on the chart with the pen at mid-travel. The pivot supports are made of stainless steel and the non-magnetic plate of bronze. For many slightly active aqueous solutions such as sugar, etc., the same materials can be used, except that the displacer is made of copper or bronze instead of steel.

For organic or mineral acids the cast iron casing can be fully protected with enamelled coating or lined with lead, tin, or suitable material to make it as nearly acid-proof as possible; it is also possible to make it of bronze casting. The displacer is made acid-proof by the use of bronze, nickel, monel, or other material. If none of these metals is acid proof, these parts are fully protected by gold plating. The non-magnetic plate, the magnet, and the pendulum parts can also be protected in a similar manner. As there is no erosion, the gold plating on these parts is quite permanent. The pivot points and cups can be made of hard acid-resisting metal such as illium, stellite, or other special metals, and in extreme cases black diamond pivot points are used.

Power Alcohol Production in Australia

THE Australian Federal Ministry has resolved to encourage the formation of a company to undertake the manufacture of power alcohol from the surplus sugar cane production of Queensland molasses and cassava. It is understood that the spirit will be manufactured by what is known as the Boulard process. By this process alcohol is procured from such things as maize, broken rice, cargo rice, and dry cassava. By employing the Boulard method the use of malt is entirely obviated, with a consequent saving in expense, while the yields obtained are the maximum possible, as the starch in the materials is converted into alcohol. The scheme was placed before it some time ago by Mr. A. V. Board, representing the Distillers Company, Ltd., of Scotland.

Fertiliser Manufacture in Canada

THERE are about 79 firms in Canada operating 82 plants engaged in the manufacture of fertilisers. Only two firms have complete plants including acid chambers. One of these, in British Columbia, is in active operation; the other, in Ontario, was in operation for a few months and has closed temporarily. Six plants, one each in Nova Scotia, New Brunswick and Quebec, and three in Ontario, are provided with rock grinding and acidulating machinery, but are not provided with acid plants, according to a report of the Department of Mines. Thirty-three plants make ammoniacal fertilisers from organic waste materials and market a number of grades of mixed fertilisers, but do not prepare phosphates. Two of these plants are located in Nova Scotia, five in Quebec, twelve in Ontario, three in Manitoba, one in Saskatchewan, two in Alberta and eight in British Columbia. Twelve of these plants handle fish guano from fish scrap and the rest utilise abattoir waste. There are 41 plants which purchase all their raw materials and confine their operations to dry mixing only. These plants are distributed throughout the Dominion, there being six in Nova Scotia, five in New Brunswick, eight in Quebec, thirteen in Ontario, and nine in British Columbia.

Summarising the foregoing statements, there are nine fertiliser plants in Nova Scotia, six in New Brunswick, fourteen in Quebec, twenty-nine in Ontario, three in Manitoba, one in Saskatchewan, two in Alberta and eighteen in British Columbia. In addition to the foregoing there are several abattoirs who prepare their tankage for fertiliser production, but who dispose of it in bulk to grinding and mixing plants, or export it to the United States. For business reasons several organisations find it desirable to operate under more than one firm name, mixed fertilisers of identical composition being marketed under special brand designations. These have been included in the foregoing summary as if they were separate and independent organisations.

Deposits of gypsum are known in the provinces of Nova Scotia, New Brunswick, Ontario, Manitoba, Alberta, and British Columbia. A certain amount of ground gypsum or land plaster is already produced from Canadian deposits, and there are sufficient resources available to meet all the probable needs of the agricultural industry. Deposits of limestone occur in every province of Canada. Ground limestone for use as a fertiliser material is also produced at a number of localities, and the quantity can easily be increased to meet all needs.

Arsenic Production

FINALLY revised statistics on the production of arsenic from Canadian ores, as reported by the Mining, Metallurgical, and Chemical Branch of the Dominion Bureau of Statistics, show an output of 4,621,567 pounds in 1924, as compared with 6,421,587 pounds in 1923.

Arsenic in large quantities is consumed in the manufacture of calcium arsenate, which is most effective in combating the boll-weevil, an insect that in some years is a serious menace to the southern cotton crop. In 1924 the boll-weevil was not as active as was anticipated, with the result that the large stocks of calcium arsenate on hand from the previous year were not moved, and the demand for arsenic fell off. Arsenic is used in Canada in the manufacture of paris green, lead arsenate, lime arsenate, sheep dips, and other insecticides. It is also used in the manufacture of glass, and to a small extent in medicinal and pharmaceutical preparations. It is recovered at the present time from the concentrates of the arsenical pyritic ore of the Hedley Mine, Hedley, B.C., and from concentrates of similar ore from Nova Scotia. These concentrates are exported from Canada to be treated in foreign smelters. White arsenic is recovered by the South Ontario smelters in the treatment of ores and residues from the Cobalt camp.

The 1924 production included 495,250 pounds contained in arsenical concentrates shipped to American smelters; 530,152 pounds contained in concentrates and residues shipped to European smelters and 3,596,165 pounds of white arsenic (As_2O_3) produced by South Ontario smelters.

The New York market price for arsenic, which averaged 13 cents per pound in the month of January, 1924, receded month by month until the end of the year, when large stocks were offered at 6.75 cents per pound with little demand.

Progress of British Optical Industry

In his presidential address last week in London, Mr. F. Twyman, the new president of the British Optical Instrument Manufacturers' Association, said that their industry showed examples of losses made for five successive years, of dividends missed for ten years, of liquidation of three important firms out of twenty or so of which the industry consisted, while the personnel showed an enormous reduction. Before the war, taking mass with general level of excellence, the Germans were of all nations pre-eminently the optical instrument makers. The same was probably true to-day, but the smaller optical industry of this country was, in developments of real scientific importance and novelty, still better situated than before the war. In the microscope industry, a series of apochromatic objectives were now provided which were superior to any made in any foreign country. The important British work on filter-passing micro-organisms demanded an accuracy of focussing and a rigidity which was not provided by any existing standard, and such a standard had now been evolved in this country. The best British binoculars were a little better than the best of the same class made abroad, and binoculars were now made here which had a bigger field of view than any others made. In camera lenses British superiority had been demonstrated in a very marked degree. In astronomical work the British optical industry had done well. The discs of glass for the largest telescope in the world had been successfully made. The telescope would have an aperture of 41 in., 1 in. larger than that at the Lick Observatory. The work already done by the Scientific Instrument Research Association had been of inestimable service to the industry. The Association had discovered the origin of the differences of transparency, and the advantage of British over foreign optical glass would, it was reasonable to suppose, be increased.

Competitive Dyes in U.S.A.

The U.S. Court of Customs Appeal has confirmed a Government decision in connection with a recent case of German competitive dye import. The Court held that there is legal authority to increase the actual selling price of a domestic dye in finding the market value of a competitive imported dye, because the imported product has greater dyeing strength than the domestic. The Court also held that in comparing the imported dye with the domestic dye such a comparison may be made without regard to the chief value of either. The imported dye in question was crystal violet extra, imported from Germany by Kuttroff, Pickhardt and Co., and used principally for tinting paper, but both the German product and the domestic dye, crystal violet 6B, manufactured by Butterworth-Judson Corporation, were suitable for use in dyeing wool, and in the Court's opinion, Congress had provided that a domestic dye should be considered similar to or competitive with any imported dye, if, when applied in substantially the same manner to articles or materials for which both dyes were commercially suitable, the imported dye accomplished results substantially equal to those accomplished by the domestic dye.

Helium and Air Transportation

The remarkable development of helium gas, the use of which is expected to be a big factor in the development of dirigibles to be manufactured by the Goodyear Zeppelin Corporation of U.S.A., is regarded by officials of that organisation as one of the biggest steps forward in scientific fields accomplished in recent years. Because of its non-inflammable quality, the gas has come into exclusive use by both the U.S. Army and Navy. A few years ago helium cost $2,000 a cubic foot to produce; now, at ten cents a cubic foot, it is still a very expensive thing for the use to which it is put in the greatest quantity—that of floating airships. Not so light as hydrogen, it possesses one advantage over that element for balloon use in being non-inflammable. The U.S. Government has a large helium production plant at Fort Worth, near the Texas source of supply, while a helium reserve comprising 7,100 acres of gas-bearing lands has been set aside in Emery county, Utah. Helium exists in more or less quantity in all natural gas fields. Extraction of helium from natural gas does not destroy the commercial usefulness of such gas, but improves it, as the non-inflammable element is removed. While essentially a gas, helium has and is being used to extinguish fire on many ocean liners.

British Chemical Plant Manufacturers

The British Chemical Plant Manufacturers' Association held its fifth annual general meeting at 166, Piccadilly, London, on Wednesday, July 22, when the report of the Committee was unanimously adopted.

The Committee are now taking steps to bring before chemical manufacturers the desirability of utilising British plant. With the concurrence of the organising committee of the London meeting of the Society of Chemical Industry in July, 1926, an exhibition of chemical plant is being arranged, and a sub-committee consisting of Dr. R. Seligman, Mr. J. A. Reavell, Mr. E. A. Alliott, and Mr. W. J. U. Woolcock has been appointed to prepare the plans.

The following officers were elected for 1925-26:—Chairman, Dr. R. Seligman; vice-chairman, Mr. J. A. Reavell; honorary treasurer, Mr. E. A. Alliott.

During the evening a dinner was held at the Holborn Restaurant. The guests of the Association were Mr. F. H. Carr, Mr. J. V. N. Dorr, Mr. E. V. Evans, and Mr. R. L. Mond. The speeches were characterised by a call for greater sympathy between British plant manufacturers and their clients the chemical manufacturers. Several speakers referred to methods adopted by continental competitors, and emphasis was laid on the necessity for the plant manufacturers to understand the processes to be carried out. Mr. Dorr, in particular, referred to the successful results which had attended the holding of chemical expositions in New York, and wished prosperity to the Association's plans for next summer.

Safety in Mines Research

In the report of the Safety in Mines Research Board for 1924, just published by the Mines Department, reference is made to the increasing co-operation between the Board and the U.S.A. Bureau of Mines. The Board state that they have been offered by the University of Sheffield a lease on advantageous terms of an excellent site for their laboratories adjoining the University buildings, and thus an exceptional opportunity has been presented of providing a suitable centre for laboratory work on safety research. Investigations have been carried on with regard to coal dust and firedamp explosions, spontaneous combustion of coal, the construction of explosion-proof casings for electrical machinery, electrical researches, the support of underground workings, etc. The report gives particulars of researches carried out during 1924 with the aid of grants made on the recommendation of the Board out of the Miners' Welfare Fund. The Board state that they are disappointed at the slow growth of grant-aided researches, and repeat that they are anxious for each centre of higher education in mining to undertake researches on specific problems which possess a special local importance, and that they are always ready to recommend the Miners' Welfare Committee to make grants for the carrying on of such researches in charge of competent investigators.

Standard Specification for Cast Iron Filter Plates

The British Engineering Standards Association has issued a Specification No. 189, 1925, Cast Iron Filter Plates and Frames, which was prepared as a result of proposals received by the Joint Committee of British Chemical Manufacturers and the British Chemical Plant Manufacturers' Association. Adherence to existing practice has been adopted as far as possible with a view to minimising the introduction of fresh cloth widths and enabling plates to be used in as many existing presses as possible. By means of a questionnaire, circulated to all bodies and firms (so far as possible) who were thought likely to be interested in the subject, particulars of installations comprising over eight hundred cast iron presses were secured. A suitable range of four sizes was chosen, which covered about 70 per cent. of the above presses, and types of plates were selected to cover the majority of ordinary requirements, while makers are allowed a wide discretion in the design of the filter surfaces, handles, heads and closing gear, type of iron used, thickness of plate, etc. The Association is open to consider the standardisation of further types should any sufficient demand be expressed. Copies of the specification may be obtained from the B.E.S.A. Publications Department, 28, Victoria Street, London, S.W.1 (1s. 2d. post free).

Chemical Matters in Parliament

Baku Oil Concessions

Sir Walter de Frece (House of Commons, July 22) asked the Secretary of State for Foreign Affairs whether his attention has been called to the Soviet Government's proposal to offer to the French a concession of oil-bearing properties in Baku, some of which were confiscated from British companies; and whether he could make any statement.

Mr. Chamberlain said that he had no knowledge of an official proposal from the Soviet Government involving British interests, or, indeed, of any official proposal at all.

Chemical Warfare

Mr. Cecil Wilson (House of Commons, July 22) asked the Secretary of State for War whether he was aware that in many countries scientific investigation was taking place regarding the most deadly forms of poison gas and other inventions designed to exterminate human life; whether any steps were now being taken in this country, or when would they be taken, in instructing the civil population in protecton methods.

The Secretary of State for War (Sir Laming Worthington-Evans) said that the answer to the first part of the question was in the affirmative. The measures to be taken for the protection of the civil population against poison gas were now being considered by the Committee of Imperial Defence.

Mr. Thurtle asked whether any gas of this character was being manufactured in this country, but was told that that did not arise out of the question.

Mr. A. Chamberlain (House of Commons, July 27), in reply to Colonel England, said that at the Arms Traffic Convention at Geneva in May last a protocol was drawn up prohibiting the use of chemical or bacteriological methods of warfare. Twenty-five States had signed the protocol and it remained open for accession by other Powers. It came into force immediately on ratification as between those States that had ratified.

Sir L. Worthington-Evans (House of Commons, July 28), in reply to Mr. Thurtle, said that poison gas was being manufactured only on a very small scale in this country for experimental purposes.

Merchandise Marks Bill

Lieut.-Commander Kenworthy (House of Commons, July 22) asked with reference to the Bill which was to be presented by the Minister of Agriculture in regard to merchandise marks, whether it was proposed to proceed with it before the House rose for the Autumn Recess—to take another stage of it.

The Prime Minister said that he did not think there was the slightest chance of that.

Masks in Aerated Water Works

Sir W. Joynson-Hicks (House of Commons, July 23) in reply to a suggestion that the use of masks recommended by the chief inspector should be compulsory, said that there was no need for any such order. The Regulations required the provision of suitable face guards, and that had enabled the inspectors, where an unsatisfactory type of guard was in use, to insist on its replacement by a satisfactory guard. Different workers appeared to prefer different types.

Preservatives in Food

Mr. Chamberlain (House of Commons, July 23), in answer to several questions, said that he had had an offer from one large firm interested in the production of boron compounds, to co-operate in a further inquiry into the effect of the consumption of small quantities of such compounds in food, but he did not think it necessary to institute any further inquiry.

New Petroleum Bill

Mr. Couper (House of Commons, July 23) asked the Home Secretary whether he was now in a position to state which of the safety provisions of the 1923 Bill were to be included in the new Petroleum Bill; and when he proposed to introduce legislation for the protection of workers in industries using petroleum in manufacturing processes?

Sir W. Joynson-Hicks said that he was not in a position to make any statement on the subject of this Bill at present. He was not sure what the member had in mind and he asked for particulars of any cases in which the member thought further protection required. Generally speaking, the protection of factory workers was provided for under the powers of the Factory Acts.

Lead Poisoning in Pottery Industry

Sir W. Joynson-Hicks (House of Commons, July 23), in reply to Mr. Clowes, gave full detail of the deaths by lead poisoning in the pottery industry during 1924. There were 18 cases of which 15 were men. The majority of these cases were glost placers, but dippers and ware cleaners were included. The length of service ranged from 16 to 47 years.

Cement Firm's Wages

Mr. W. Thorne (House of Commons, July 23) asked the First Lord of the Admiralty if he was aware that the firm of Burley, Smeed and Dean, Sittingbourne, contractors to the Admiralty, refused to recognise or pay the rates and conditions agreed to by the National Joint Industrial Council for the cement manufacturing industry; and whether he would take action in the matter.

Mr. Davidson said that he understood the firms of C. Burley Ltd., and Smeed, Dean and Co., Ltd., were not parties to the agreement of the Industrial Council concerning the wages and conditions in the cement manufacturing industry; the fact that the firms named did not recognise the agreement referred to did not afford any ground for action by the Admiralty, and therefore in the circumstances the Admiralty could not intervene.

Therapeutic Substances Bill

The Therapeutic Substances Bill, considered in Committee, was read and passed the third time, with certain amendments, on July 24.

Scientific Research Expenses

Captain MacMillan (House of Commons, July 27) asked the Financial Secretary to the Treasury whether, in arriving at the total of £4,045,000 provided in the Estimates 1925-26, for scientific research, distinction was made between research, development and experiment; whether he would give a detailed statement showing the different items of the total mentioned; and whether he could state the sum spent on scientific research carried on purely for the advancement of natural knowledge and made known through the usual scientific publications.

Mr. Guinness said that the answer to the first part of the question was in the negative. He gave the full figures, which included: Mines Department, £1,850; Department of Scientific and Industrial Research, £380,263; Scientific Investigation, £158,687. He said that the work of the Government Chemist involved varying expenditure that could not be estimated. The methods of pure and applied science were the same.

Peroxide of Manganese Concession

Mr. R. Morrison (House of Commons, July 28) asked the President of the Board of Trade whether he was aware that the agreement recently signed between the Harriman Combine and the Soviet Government had placed a monopoly of Caucasian peroxide of manganese in the hands of an American combine; and, as this product was largely used by British bottle manufacturers, whether any efforts were being made to find a substitute?

Sir P. Cunliffe-Lister said that he had no reason to think that the arrangement would interfere with the supplies to British glassmakers. Satisfactory supplies of manganese peroxide were obtainable from other sources, and also other substances were available for use as glass decolorisers.

Lieut.-Commander Kenworthy asked if it was a fact that a monopoly had been given to an American combine by the Russian Government?

Sir P. Cunliffe-Lister said that there was a concession; but, he believed, not a monopoly. It was only for a period.

Superphosphate Inquiry Report

Sir P. Cunliffe-Lister (House of Commons, July 28) said that the Report of the Committee of Inquiry on Superphosphates would be published immediately. In view of the findings of the Committee the Govermment did not propose to take any further action in the case. It was not proposed to publish reports on safeguarding of industries inquiries until the Government was in a position to legislate, in order to avoid accumulation of stocks.

From Week to Week

SIR ARTHUR H. MCMAHON has accepted a seat on the board of the Shell Transport and Trading Co.

THE FINDINGS OF THE COMMITTEE on the use of preservatives in food are expected to be published in about a week's time.

SIR ALFRED MOND, acting on medical advice, has cancelled all his engagements until September and has gone abroad for treatment.

COLONEL H. W. BURTON, director of British Sugar Manufacturers, Ltd., has been appointed a member of the committee of the British Sugar Beet Society.

THE LIBRARY OF THE CHEMICAL SOCIETY will be closed for stock-taking from Monday, August 3, until Saturday, August 15, inclusive, and will close each evening at 5 o'clock from August 17 to September 12.

MR. AND MRS. ROBERT MOND have left London, and will be away until the beginning of September. Mr. and Mrs. Henry Mond sailed last week in the *Arundel Castle* for South Africa, and intend to return to England at the end of October.

DAMAGE ESTIMATED AT £75,000 was caused by a fire following a thunderstorm to the factory of C. Tomlin and Co., artificial silk goods manufacturers, at Hinckley, Leicestershire. Concrete construction saved the ground floors, but the other parts were destroyed.

THE PROPOSAL to establish a Chair of Highway Engineering at London University has the support of the Minister of Transport, the Director-General of Roads, and the Worshipful Company of Paviors. The Chair will cost £30,000 to endow and £7,000 has been already received.

REPORTS STATE that a company is to be floated in New Zealand for the fixation of atmospheric nitrogen in the Fjord district—the south-west corner of South Island, New Zealand. British and local capital are said to be involved and the site offers great water power and good water transport at the works.

A SERIOUS FIRE destroyed practically the whole of the Brookside tannery of J. and W. Story at Wigton on Thursday, July 23. The fire is thought to have been caused by the intense heat, and is stated to have been the most serious fire in Wigton during the last century. The loss, estimated at many thousands of pounds, is covered by insurance.

THE DECISION OF THE UNITED STATES BOARD OF GENERAL APPRAISERS that imported indanthrene blue powder was competitive with ponsol blue R.P. paste made in the United States has been reversed on appeal by the Court of Customs Appeals. The evidence at the appeal showed that indanthrene blue powder is specially designed and manufactured for the tinting of photograph and other high-grade papers, and that no blue colour or powder similar to it or equal to it in results is made in the United States.

NO ACTION is to be taken by the Indian Government on the Tariff Board's report on the cement industry. The report recommended the Government to bring in legislation with a view to granting bounties, but not to make it effective before satisfying themselves that the grant of bounties would not lower the price of Indian cement in relation to British cement. The Government considers there are objections of principle to conditional legislation, and that it is, therefore, premature to discuss what action might be taken if the industry were to change completely.

THE REPORT ON THE EXPLOSION from a digester at the works of the Organic Ammonia Co., Ltd., near Chester, on January 2, has been published by H.M. Stationery Office. It states that the cause of the explosion was the unsatisfactory design of the cover of the digester, having regard to the material from which it was made, the method of making the joint, and the uneven tightening up of the nuts of the securing bolts when making the joint tight. One man died of injuries as a result of the accident. The report includes the statement that the firm has decided to use mild steel for new covers.

APPLICATIONS ARE INVITED for the following appointments, on or before the dates mentioned. A resident tutor for mathematics and physics at the Borough Road Training College—The Secretary, British and Foreign School Society, 114, Temple Chambers, Temple Avenue, E.C.4 (August 8). Two junior engineers at the Forest Products Research Laboratories of the Department of Scientific and Industrial Research, South Farnborough—The Secretary, The Department of Scientific and Industrial Research, 16, Old Queen Street, S.W.1 (August 8). An evening lecturer in bacteriology at the Battersea Polytechnic—The Principal. A graduate master for physics and chemistry at the Andover Grammar School—The Director of Education, The Castle, Winchester. Laboratory assistant for the Veterinary Research Department of the Uganda Government. Candidates, aged 25-35, should be certified laboratory assistants. Apply by letter, stating age, experience, and qualifications, to Crown Agents for the Colonies, 4, Millbank, Westminster (Reference No. M/13,800).

DR. E. K. RIDEAL, Trinity Hall, Cambridge, has been reappointed Humphrey Owen Jones lecturer in physical chemistry.

A REVISION OF THE BRITISH PHARMACOPŒIA is to be carried out under the recommendation of the General Medical Council.

BERNARD, SCHOLLE AND CO., LTD., are stated to have purchased 120,000 7 per cent. preference shares of Burt, Boulton and Haywood, Ltd.

LEVER BROTHERS' JAPANESE INTERESTS are being negotiated for by Mr. Matsukata, president of the Kawasaki Dock Co. The price mentioned is £275,000.

NITRATE LANDS in Tarapaca and Antofagasta will be sold by auction, with reserves, on September 11 before the Junta de Almoneda at Santiago-de-Chile.

PROFESSOR G. H. THOMSON, D.Sc., PH.D., principal of Armstrong College, Newcastle, is to be Professor of Education at Edinburgh University and Director of Studies at Edinburgh Training Centre for Teachers.

THE FOLLOWING SOAP PRICES have been accepted for supply by Birmingham Guardians: Carbolic soap, 37s. 9d. per cwt., compared with 37s. 6d. in June; soft soap, 8s. per firkin, against 8s. 1½d.; soft soap, 15s. per cwt., against 15s. 6d.; yellow soap, 37s., against 35s.

THE VISCOSE CO., of Marcus Hook, are to erect two units for the manufacture of rayon at Parkersburg at a cost of over $5,000,000. Over 2,500 operatives will be employed and further units are expected to be added. The company already has three rayon factories.

MR. ROBERT DEMPSTER, of Northwich, Cheshire, left £518,819. He was a director of R. and J. Dempster, Ltd., Manchester, of the Carnbroc Chemical Co., Ltd., of the Deanbank Chemical Co., Ltd., of the Whitwood Chemical Co., Ltd., and of the Langloon Iron and Chemical Co., Ltd.

GLASGOW CORPORATION'S GAS REPORT for the year 1924–25 states that the residual products coke showed a reduction of £38,460, caused by a decrease in export, quotations having fallen from 35s. to 15s. per ton. Ammoniacal liquor and tar showed a decrease of £77,380, due to fallen prices.

THE DU PONT CO. announce the production of two new colours—Pontamine Fast Brown R.K., a direct dye giving a bright reddish brown shade on cotton, and Pontamine Fast Black LND, which the makers claim surpasses any product of similar chemical constitution in brightness and is recommended especially for half-silk hosiery.

PROFESSOR THOMAS TURNER has been appointed Dean of the Faculty of Science of the University of Birmingham, in succession to Professor Birstall, head of the Mechanical Engineering Department. For many years Professor Turner has been chief of the Metallurgical Department of the University, and recently received the Bessemer gold medal of the Iron and Steel Institute for 1925.

THE BRITISH PHARMACEUTICAL CONFERENCE opened at Glasgow on Tuesday. Mr. Edmund White, president, referred to the Society's decision to set up a laboratory for the biological examination and standardisation of remedial substances. He referred to the need for the unification of chemical methods of assay, not only from an international pharmaceutical standpoint, but for purposes of international commerce.

VICKERS, LTD., have now acquired the whole interest in the Vickers-Spearing Boiler Co. Mr. A. H. Spearing has resigned his position as managing director, and is no longer connected with the company. The company will be carried on under the name of "Vickers-Spearing Boiler Co., Ltd.," as before. This change also gives Vickers, Ltd., the control of Tinkers, Ltd., Daisyfield Boiler Works, Hyde, near Manchester.

THE DEGREE OF D.Sc. has been awarded by Birmingham University to Dr. W E Garner, for papers on gaseous explosions, heats of formation, detonation, crystallisation of organic substances, and other chemical subjects; Mr J D. Morgan, for papers on the ignition of explosive gases, and flame movements in gaseous explosions; and Mr. D. R. Nanji, for papers on chemical and biochemical subjects, mainly on the constutition of starch and the action of enzymes.

SIR ERNEST BENN, BART., chairman of Benn Brothers, Ltd., and the associated companies, will leave England about the end of August for a tour through Canada and the United States, accompanied by his mother (Elizabeth Lady Benn, widow of Sir John Benn), his second son, Mr. Glanvill Benn (who will remain in the United States for some time for the purpose of studying American publication methods), and his eldest daughter, Miss Betty Benn. Sir Ernest's eldest son, Mr. John Andrews Benn, having finished his university studies at Princeton (U.S.A.) and Cambridge, has just entered the business of Benn Brothers, Ltd., being associated for the present with THE CHEMICAL AGE.

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CAMPHOR.—The production of synthetic camphor. Part II. E. Toussaint. *Rev. Chim. Ind.*, June, 1925, pp. 173–177.

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REDUCTION.—The reduction of nitrosophenols with alkali sulphides. A. Porai-Koschitz. *Chem.-Zeit.*, July 16, 1925, pp. 595–596.

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ANALYSIS.—An iodometric determination of methylene blue. T. Sabalitschka and W. Erdmann. *Chem.-Zeit.*, July 7, 1925, p. 561.

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Abstracts of Complete Specifications

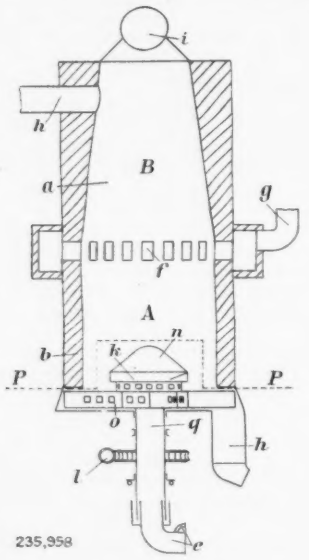
235,924. Phosphates and Other Reducible Compounds, Process of Working Up. H. Mehner, 66, Schlosstrasse, Charlottenburg, Berlin. Application date, January 1, 1924.

This process is particularly for the production of phosphoric acid from impure phosphates. A layer of phosphates, carbon, and sand is placed on a hearth of a furnace and heated to a bright red heat by the combustion of heating gases in the furnace. Phosphorus is liberated at 1400° C., and after the reduction has commenced the subsequent heating is effected by the combustion of phosphorus and carbon monoxide, which burn to phosphorus pentoxide and carbon dioxide. The phosphorus pentoxide is drawn off from the furnace and condensed. It is found that once the reaction is started, the flame temperature is sufficient to maintain it even when a new charge is introduced. The combustion temperature may be reduced by controlling the admission of air. This process is more economical than that in which sulphuric acid is used, since this is replaced by sand, and the crude phosphate need not be finely ground. Further, it is possible to use many phosphates which are otherwise unsuitable, *e.g.*, those containing iron. The residue of calcium silicate remaining in the furnace may be employed for the manufacture of cement or glass. This residue may contain some of the phosphorus, and may be employed as a fertiliser.

The principle of this process—*i.e.*, the separation of a constituent which is then burned with the other products of reduction to provide the necessary heat for the process—may also be applied to the treatment of other substances such as natural or artificial silicates to obtain soda, or to the treatment of potash feldspar or leucite to obtain potash. Green sand may be similarly treated to produce ferro-silicon, and alkali carbonate. Ferro-silicon and alumina can also be obtained from ordinary clay with addition of iron.

235,958. Combustible Gases and Coke from Bituminous Fuel, Process for Producing. The Power-Gas Corportation, Ltd., and N. E. Rambush, Parkfield Works, Stockton-on-Tees. Application date, March 26th, 1924.

The object of this process is to obtain a mixture of water gas and coal gas with a maximum yield of low-temperature tar,



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ammonia, and coke. The usual down-steaming operation is omitted, and coke is continuously withdrawn from the lowest part of the fuel zone at such a rate that up-steaming alone can be maintained without displacing the reactive zone upwards. In this manner the active semi-coke can be brought to the required condition without reaching the high-temperature which usually prevails. The cycle comprises three stages instead of five: (1) "hot blowing" for one to one and a half minutes, during which the semi-coke in the lowest zone is rendered incandescent, and the blow gases are discharged about the middle of the fuel column; (2) the scavenging stage in which steam is admitted till water gas escapes through the blow gas ports; (3) "cold blowing" for three to five minutes by an ascending current of steam, while the water gas passes upwards through the bituminous fuel and distils it. The coke is continuously withdrawn at the bottom of the column at such a rate that the incandescent zone is maintained stationary near the bottom of the generator.

In the generator "B" the fuel is supplied at the top, the blow gas escapes through the outlets *f*, and the water gas and distillation gases through the outlet *h*. A mechanical coke extractor is used, mounted on a hollow shaft *q* which is rotated by gearing *l*. The coke extractor consists of a hood *n* having radial blades or cutting arms which cut the surrounding coke and displace it into a number of pockets *p*. Air and steam are introduced at *e* and issue through ports in the hood. This apparatus is simpler than the usual, owing to the omission of the downward steaming and also safer, in that the air blast cannot mix with the gas in the conduits outside the generator. A larger yield of ammonia is obtained, since it is not decomposed by blowing through the incandescent fuel, and a high yield of low temperature tar for the same reason.

236,002. Carbonisation of Bituminous Coal. J. C. Jolly, 49, Industry Street, Walkley, Sheffield, and R. V. Wheeler, the Department of Fuel Technology, The University, St. George's Square, Sheffield. Application date, May 1, 1924.

The object is to obtain a greater elimination of sulphur compounds during the carbonisation of bituminous coal, so that the coke obtained is more suitable for metallurgical purposes. The coal is mixed with a material such that when the mixture is heated a high proportion of reducing gas is obtained, the material being of such thermal stability at 400°–600° C. that it does not tend to bind the coal. The preferred material is anthracite, or a semi-bituminous coal which may be as mined or weathered, or bituminous coal which has been weathered or carbonised below 600° C. or peat or lignite or the residues obtained by carbonising them below 600° C. The essential feature is that the mixture should produce a high percentage of hydrogen or other reducing gas, and that the added material should be inert between 400° C. and 600° C.

236,037. Acetyl Silk, Production of Fast Greenish-Yellow Shades on. British Dyestuffs Corporation, Ltd., 70, Spring Gardens, Manchester, J. Baddiley and J. Hill, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, June 20, 1924.

Yellow dyestuffs previously obtained for use with cellulose acetate have insufficient affinity for the fibre, or are subject to the fault of phototropy. This applied to the azodyestuffs and also to *o*-chlor-*p*-nitraniline. It has now been found that these faults can be avoided by employing the monoazo dyes from aniline and its homologues and derivatives, including particularly halogenated aniline and toluidines with 1:3-dihydroxy-quinoline. The dyes may be employed in the form of an aqueous suspension, or in colloidal form with the assistance of a suitable dispersing agent.

236,086. Formaldehyde, Manufacture of. W. Carpmael, London. From K. Kaiser, 52, Kastanienallee, Berlin-Westend, Germany. Application date, October 17, 1924.

The process is for the manufacture of formaldehyde by oxidising methane in the presence of an inert substance impregnated with catalytic oxide or hydroxide. The inert substance, such as pumice stone, may be impregnated with a solution of a substance which will precipitate the oxide or hydroxide from the salt of the metal. The inert substance may alternatively be impregnated with a metal salt and then treated with a precipitating agent. In another alternative the metal salt is replaced by a colloidal solution of a metallic oxide or hydroxide of iron, manganese, or chromium. The inert substance may be impregnated with an alkali carbonate adapted to precipitate colloidal metal oxides from other solutions as gels. The precipitating agent need not be employed, in which case the inert substance is impregnated with a

colloidal solution of a catalytic metal oxide and heated to precipitate the oxide as gel. In an example, pumice stone impregnated with a mixture of iron oxide and chromium oxide is placed in a quartz tube, which is then heated and the mixture of air and methane passed through it. The gases are cooled and condensed in water, giving a yield of 37 per cent. of formaldehyde and 4 per cent. of methyl alcohol.

236,087. COLLOIDAL OR SEMI-COLLOIDAL SUBSTANCES, PRECIPITATES OR SEDIMENTS, MANUFACTURE AND MANIPULATION OF—AND SEPARATION OR RECOVERY OF THE LIQUID OR SOLID COMPONENTS. Spencer, Chapman and Messel, Ltd., 36, Mark Lane, London, E.C.3, and J. B. Liebert, 4, Overbury Avenue, Beckenham, Kent. Application date, October 20, 1924.

This process is particularly for clarifying solutions of the sulphates of thorium, titanium, etc., which have a cloudy appearance due to the presence of insoluble oxides in colloidal form in suspension. It has been found that gelatinous substances such as glue, casein, gelatine, albumen, etc., will cause the coagulation and separation of these colloidal particles. In an example, ilmenite is treated with concentrated sulphuric acid to obtain the sulphates of iron and titanium. The product when digested with water yields a brownish solution consisting of the sulphates with suspended particles of the mineral, oxides, and impurities. This liquor is clarified by the addition of a small proportion of the gelatinous substance which causes the coagulation and settling of the suspended particles. The decanted solution contains titanic sulphate, ferric sulphate, and ferrous sulphate. The ferric sulphate is then reduced to ferrous sulphate by means of iron, and the ferrous sulphate allowed to crystallise. The sulphate solution is then boiled and poured into boiling water, which precipitates titanic oxide as a white crystalline powder. This precipitation is facilitated by the addition of a further small proportion of the gelatinous substance. The proportion of glue required for the clarification is about 1 lb. to 500 gallons of the solution of sulphates.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—210,095 (Farbwerke vorm. Meister, Lucius and Brüning), relating to manufacture of bismuth compounds, see Vol. x, p. 301 ; 213,593 (J. R. Geigy Soc. Anon.), relating to dyeing acetyl cellulose, see Vol. x, p. 602 ; 219,024 (Naamlooze Vennoostschap Philips' Gloeilampenfabrieken), relating to separation of hafnium and zirconium, see Vol. xi, p. 298 ; 220,321 (Naugatuck Chemical Co.), relating to retardation of deterioration of rubber, see Vol. xi, p. 401 ; 226,142 (J. H. Bregeat), relating to purification or dehydration of cellulose esters and ethers, see Vol. xii, p. 162.

International Specifications not yet Accepted

234,470. DYES. Akt.Ges. für Anilin Fabrikation, Treptow, Berlin. International Convention date, May 23, 1924.

2-methyl-3-amino-6-oxyphenazine is heated with sodium sulphide and sulphur to 190° C., yielding a dyestuff which gives brown shades on cotton from a sodium sulphide bath. If the heating is carried to 235°-240° C. and copper sulphate is also present, blackish brown shades are obtained.

234,485. ALUMINIUM FLUORIDE AND SILICA. Rütgerswerke Akt.-Ges., 43, Hardenbergstrasse, Charlottenburg, Berlin. (Assignees of J. Domansky, 60, Leibnizstrasse, Charlottenburg, Berlin.) International Convention date, May 26, 1924.

Clay or bauxite is treated with aqueous hydrofluoric acid, the aluminous material being in excess. The products are aluminium fluoride and silica, and any silica remaining in solution is precipitated by adding reactive alumina. The aluminium fluoride may be treated with soda to obtain cryolite. The precipitated silica has great absorptive power.

234,518. TITANIUM OXIDE. Deutsche Gasglühlicht-Auer-Ges., 11, Ehrenbergstrasse, Berlin. International Convention date, May 24, 1924.

Acid solutions of titanium sulphate are hydrolysed under pressure at 160°-180° C. with a solution of specific gravity 1·35-1·55, and total acid content of 25 per cent. to 45 per cent. An alkali sulphate may be added to obtain the necessary pecific gravity.

234,772. SYNTHETIC DRUGS. Farbwerke vorm. Meister, Lucius and Brüning, Hoechst-on-Main, Germany. International Convention date, June 2, 1924. Addition to 225,875.

Complex gold compounds having therapeutic properties are obtained by treating gold salts with heterocyclic or acyclic compounds derived from thiourea, other than a thiobenzimidazole. Complex gold compounds of thiohydantoic acid and thiobarbituric acid by reaction with potassium auribromide, are described.

234,806. SYNTHETIC DRUGS. Chemische Fabrik auf Aktien vorm. E. Schering, 170, Müllerstrasse, Berlin. International Convention date, June 2, 1924.

To obtain acyl derivatives of cyclic amino-metalmercapto compounds, the cyclic amino-metalmercapto compound is acylated, or the cyclic amino-mercapto compound is first acylated, and a metal then introduced into the mercapto group. In one example, an alkaline solution of 4-amino-2-argento-mercaptobenzene-1-carboxylic acid is treated with acetic anhydride or phosgene, the precipitate dissolved in soda, and alcohol added to precipitate the sodium salt of 4-acetylamino-2-argento-mercaptobenzene-1-carboxylic acid, or of the diphenylurea compound respectively.

234,826. TREATING SULPHIDE ORES. F. Krupp Grusonwerk Akt.-Ges., Buckau, Magdeburg, Germany. (Assignees of F. Johannsen, 405, Rollstrasse, Clausthal-on-Harz, Germany.) International Convention date, May 30, 1924.

The process is for converting sulphide ores or products containing volatile metals such as zinc, lead, tin, bismuth, arsenic, antimony, etc., into oxides. The ore is mixed with sufficient coke to maintain a reducing atmosphere, and heated to 1,200°-1,400° C. Alkaline earth compounds are added to fix the sulphur. At the high temperature employed, the metals are volatilised and the sulphur combined with the residue in one operation without previous roasting. A refractory material such as alumina, silica or limestone may be added to prevent liquefaction of the charge in the volatilisation zone.

234,830. ALUMINA. T. R. Haglund, 8, Runebergsgatan, Stockholm. International Convention date, June 2, 1924.

Bauxite is subjected to a preliminary treatment to convert the iron into ferrous sulphide before conversion of the alumina into sulphide in an electric furnace. The material is treated with a solid or gaseous reducing agent to reduce the iron to ferrous or metallic state, and then with sulphur vapour, sulphuretted hydrogen, carbon oxysulphide, carbon disulphide or iron pyrites to produce iron sulphide. These operations may be effected in a shaft furnace with a reducing atmosphere below, the sulphur-containing gas being introduced where the reduction is complete. The furnace used may be associated with the electric furnace subsequently used, and the sulphuretted hydrogen evolved can be used to cool the roof of the electric furnace.

In using pyrites as the source of sulphur, the bauxite may be first reduced in a separate furnace, and then briquetted with the pyrites and charged into the electric furnace. The iron is then converted into sulphide in the upper part of the furnace before the charge melts. The final melt, which may contain sulphides of aluminium, barium, calcium or magnesium, may be treated to liberate sulphuretted hydrogen, which may then be used as the sulphidising agent in the process.

234,852. HYDROFLUORIC ACID. M. Buchner, 1, Schellingstrasse, Kleefeld, Hannover, Germany. International Convention date, June 2, 1924.

Impure fluorspar is treated with sulphuric acid, and the mixture of hydrofluoric and hydrofluosilicic acids then converted wholly into hydrofluosilicic acid by means of silicon fluoride. The hydrofluosilicic acid is then treated with sodium, potassium or barium fluoride, yielding pure hydrofluoric acid and a silico-fluoride. The latter may be heated to yield a metallic fluoride and silicon fluoride which may be used again. Excess of silicon fluoride may be treated with sodium chloride and fluorspar, with a small quantity of acid, to obtain sodium silicofluoride. Boron fluoride may be added to the impure fluorspar or to the mixture of hydrofluoric and hydrofluosilicic acids. The pure hydrofluoric acid obtained is then associated with a mixture of silicofluoride and another complex fluoride which can be heated to yield boron fluoride for use again.

LATEST NOTIFICATIONS.

237,228. Processes for producing acetone and butyl alcohol. Freiberg, G. W. July 17, 1924.

237,242. Process for the manufacture of margarine or other edible fats containing vitamines. Mustad O., and Son. July 16, 1924.

237,243. Method of decomposing metal sulphates by heating. Jacobsson, R. July 16, 1924.

237,256. Liquid injection causing the destruction of all insects and worms attacking fruit trees and the fruit thereof, and for improving the size and quality of the fruit, etc. Roelofsz, C. M. July 16, 1924.

237,257. Process and apparatus for utilising the by-products and heat produced by the combustion of incompletely oxidised sulphur compounds. Chmura, T. July 15, 1924.

237,288. Electrolytic separation of metallic chromium. Liebreich, E. July 21, 1924.

237,294. Manufacture of vat-dyestuffs. Farbwerke Vorm. Meister, Lucius, and Brüning. July 21, 1924.

237,295. Manufacture of products for dyeing or printing textile fibres and other materials. Durand and Huguenin Soc. Anon. July 21, 1924.

Specifications Accepted with Date of Application

215,336. Converting hydrocarbons and mineral oils having a high boiling point into those having a lower boiling point, Process for. H. Wolf. May 1, 1923.

220,936. Hafnium and zirconium, Process for separating. Naamlooze Vennootschap Philips' Gloeilampenfabrieken. August 25, 1923.

225,501. Grey cast iron, Process for the manufacture of high quality. H. Lanz. (Firm of). Dec. 1, 1923.

226,147. Stand pipes for the discharge of distillation products from a retort into a collecting main of a carbonising plant. Koppers Co. Dec. 13, 1923.

226,533. Utilising the energy of liquids under pressure containing gases, Means for. Synthetic Ammonia and Nitrates, Ltd. December 17, 1923.

227,107. Acid resisting bodies, Production of. W. Eberlein. January 4, 1924.

228,494. Mineral coal, Method for the production of a stiff tar, rich in undecomposed bitumen, and of a coke, rich in gases readily inflammable. F. Seidenschnur. January 30, 1924.

232,560. Calcium hypochlorite compounds, Process for drying. Chemische Fabrik Griesheim Elektron. April 15, 1924.

233,335. Carbonisation and distillation of wood, Apparatus for. R. Malbay. May 5, 1924.

236,603. Gas mixtures, especially air or other difficultly-liquefiable gas mixtures, Process for separating. R. F. Mewes and R. K. E. Mewes. February 4, 1924.

236,633. Rubber latex, Process for the coagulation of. H. W. Hammond. April 8, 1924.

236,739. Reducing metal oxide, Process of. W. B. Hamilton and F. Reid. July 29, 1924.

236,780. Coal, Total gasification of. H. Fairbrother. (*Jackson Research Corporation.*) October 13, 1924.

236,782. Purifying antimonial lead alloys or other antimonial metals. H. Wade. (*United States Smelting, Refining and Mining Co.*). October 16, 1924.

236,795. Quinonoid derivatives of 2:1-naphthophenothiazine, Manufacture of. A. G. Bloxam. (*Akt.-Ges. für Anilin Fabrikation.*) November 7, 1924.

Applications for Patents

Bass, H., and Erste-Böhmische Kunstseidefabrik Akt.-Ges. Manufacture of artificial threads from viscose. 18,867. July 24.

Billner, K. P. Concrete material. 18,690. July 22.

Bloxam, A. G., and Chemische Fabrik Griesheim-Elektron. Manufacture of dyestuffs. 18,500. July 20.

Boake, Roberts, and Co., Ltd., A., and Silberrad, O. Chlorination of organic compounds. 18,659. July 22.

Bollmann, H. Method for removing phosphatides from vegetable oils. 18,510. July 20. (Germany, May 15.)

Boothby, F. L. M. Clothing for protection against corrosive or poisonous gases. 18,615. July 21.

Chemische Fabrik auf Actien (Vorm. E. Schering) and Klaphake, W. Manufacture of silica gel. 18,523. July 20.

Colloisil Colour Co., Ltd., and Goedecke, C. E. J. Production of dyestuff emulsions, etc. 18,899. July 24. (April 9.)

Coxon, T., and Synthetic Ammonia and Nitrates, Ltd. Production of solid compounds of ammonia, carbon dioxide, and water. 18,741. July 23.

Deppe Söhne, A., and Zeitschel, F. O. Process for isolating alcohols or phenols from mixtures. 18,574. July 21.

Diaz, A. V. Gasification of liquid fuels. 18,897. July 24. (Spain, August 16, 1924.)

Drescher, H. A. E., and Scottish Dyes, Ltd., and Smith, W., and Thomas, J. Production of anthraquinone derivatives. 18,597. July 21.

Durand et Huguenin Soc. Anon. Manufacture of products for dyeing or printing textile fibres, etc. 18,584. July 21. (Germany, July 21, 1924.)

Farbwerke vorm. Meister, Lucius, and Brüning. Manufacture of vat dyestuffs. 18,583. July 21. (Germany, July 21, 1924.)

Heather, F. Surfaces for roads, etc. 18,944. July 25.

Isajev, V. Production of bornyl esters from pinene, etc. 18,764. July 23.

Jones, F. J. C. Distillation of zinc and production of zinc oxide. 18,920. July 25.

Landgraf, H. Apparatus for manufacture of soap. 18,565. July 21.

Liebreich, E. Electrolytic separation of metallic chromium. 18,491. July 20. (Germany, July 21, 1924.)

Lister, F. V. Manufacture of bituminous emulsion. 18,880. July 24.

Metallbank und Metallgurische Ges. Akt.-Ges.. Production of sulphuric acid. 18,716. July 22.

Meyerhofer, A. F. Production of complex salts of hydrofluoric acids. 18706, 18,707. July 22. (Germany, December 20, 1923.)

Naamlooze Vennootschap Fabriek van Chemische Producten. Manufacture of cellulose formate, etc. 18,727, 18,728. July 22.

Nellensteijn, F. J., and Pataky, W. C. H. Production of fatty acids from hydrocarbons. 18,537. July 21. (Germany, August 27, 1924.)

Nyrop, A. Apparatus for atomizing liquids. 18,604. July 21. (Denmark, July 25, 1924.)

Pathé Cinéma. Anciens Etablissements Pathé Frères. Plastic compounds of acetyl cellulose. 18,708. July 22. (France, August 4, 1924.)

Pendred, L. St. L. Treatment of road surfaces. 18,671. July 22.

Pritzbuer, G. Distillation of bituminous fuels. 18,881. July 24.

American Production of Sodium Compounds

THE production of sodium compounds, not including common salt, from natural salines and brines in the United States in 1924 amounted to 76,420 short tons, valued at $1,825,850 (according to a return by the Bureau of Mines, Department of Commerce). These figures show an increase of 29 per cent. in quantity and of 3 per cent. in value over 1923. They cover the output of sodium carbonate, bicarbonate, sulphate, trona, and borate in various forms. Sodium carbonate (soda ash) and sodium bicarbonate were produced from Owens Lake by the Inyo Chemical Co. and the Natural Soda Products Co.; hydrated sodium carbonate (sal soda) by the Wyoming Soda Products Co.; sodium sulphate (salt cake) by the Western Chemicals, Inc., the Pacific Distributing Corporation of Nevada, and George Elder; hydrated sodium sulphate (Glauber's salt) by D. W. Gill; and trona, a double salt of sodium carbonate and sodium bicarbonate, by the Natural Soda Products Co. and the American Trona Corporation.

The output of boron mineral in 1924 amounted to 116,110 tons, valued at $3,183,910, compared with 136,650 short tons, valued at $3,994,790, in 1923. This includes borax (sodium borate) produced at the plant of the American Trona Corporation, and colemanite (calcium borate) mined by the Pacific Coast Borax Co., the Sucknow Chemical Co., the Westend Chemical Co., and the American Borax Co. It is reported that the exploitation of deposits of sodium salts may soon be undertaken near Tonopah, Salt Lake, Utah, and in Okanogan County, Washington.

Industrial Instruments

A catalogue of scientific instruments for industrial use has just been issued by Negretti and Zambra, 38, Holborn Viaduct, London. It contains illustrations and descriptions of a wide range of their products, from every type of thermometer to air meters and pressure gauges for general use. Pipe thermometers suitable for any liquid or steam temperatures, oil boiling, varnish and soap making, and type thermometers are among the former, and thermometer testing baths are also included. Water and mercury instruments for measuring pressure and depth are described, as well as meters for measuring the currents of air in buildings, mines, etc. Specifications of thermostats, micrometer calipers, hydrometers, and counters conclude this pamphlet, which should be of interest to all who have occasion to use measuring instruments on an industrial scale.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, July 31, 1925.

BUSINESS, of course, this week has been somewhat quiet under the influence of the holiday season and also the prevailing uncertainty in regard to the industrial situation. Prices however, are well maintained and for one or two products they are even firmer. Export demand continues disappointing and much of the business offered is at unacceptable limits.

General Chemicals

ACETONE stocks are extremely light and price is firm at £76 per ton; this market seems inclined to go higher.

ACID ACETIC is unchanged in value and a fair business is reported at £38 per ton for 80% technical with £1 per ton more for pure.

ACID CITRIC has been perhaps a shade more active and is quoted at 1s. 5d. per lb. ex store.

ACID FORMIC continues fairly active and price is firm at £48 to £49 per ton for 85%.

ACID LACTIC is unchanged in value, but business is falling off, the 50% by weight material is offered at from £43 to £44 per ton.

ACID OXALIC continues quiet, but price is relatively firm at 7¾d. per lb.

ACID TARTARIC.—Price is barely maintained at the current figure of 11½d. per lb., demand relatively small.

ALUMINA SULPHATE unchanged at £6 5s. per ton.

ARSENIC is extremely idle, with market standing at £23 per ton.

BARIUM CHLORIDE has been fairly brisk with price firm at £9 10s. per ton.

CREAM OF TARTAR is seasonably active and is quoted at £74 to £77 per ton.

EPSOM SALTS unchanged.

FORMALDEHYDE continues a weak spot, but the price is maintained at £40 to £42 per ton according to quantity and position.

LEAD ACETATE is very firm at £45 to £45 10s. per ton for white and £43 per ton for brown; demand good.

LIME ACETATE has been more active at £15 10s. per ton for grey and the market shows a firm tendency.

METHYL ALCOHOL.—There is no business to report, but the nominal price is unchanged at £48 per ton.

POTASSIUM CAUSTIC is unchanged.

POTASSIUM CHLORATE continues in good demand and is quoted at 4½d. per lb. on the spot.

POTASSIUM PERMANGANATE has been less steady, but is still quoted at 7¾d. per lb. for what business there is going.

POTASSIUM PRUSSIATE.—This product is a bright feature and some good business has been reported at 7½d. per lb.

SODIUM ACETATE.—Demand has been somewhat better at the current figure of £18 10s. to £19 per ton.

SODIUM BICHROMATE is unchanged.

SODIUM HYPOSULPHITE.—There is no change in the value, but the brisk demand recently noted for photographic quality continues.

SODIUM PRUSSIATE.—A good business is reported and the product is very firm at 4¼d. per lb.

SODIUM NITRITE is fairly active and the price is a shade firmer at £22 5s. to £22 10s. per ton.

SODIUM SULPHIDE is unchanged.

ZINC SULPHATE.—Business has been quite active at £13 per ton.

Coal Tar Products

There is little change to report in the market situation for coal tar products from last week.

90% BENZOL remains firm at 1s. 9d. to 1s. 10d. per gallon on rails, and further quantities are practically unobtainable for the near position.

PURE BENZOL is quoted at 1s. 11d. to 2s. per gallon on rails.

CREOSOTE OIL is firm, at 5¾d. per gallon on rails in the North, and 7d. to 7¼d. per gallon on rails in the South.

CRESYLIC ACID is unchanged at 1s. 7d. to 1s. 8d. per gallon on rails for the Pale quality 97/99%, while the Dark quality 95/97% is quoted at 1s. 4d. per gallon.

SOLVENT NAPHTHA is firm at 1s. 4d. to 1s. 4½d. per gallon on rails.

HEAVY NAPHTHA is quoted at 1s. 1d. per gallon on rails.

NAPHTHALENES are unchanged, the lower grades being worth from £3 to £3 15s. per ton, while the 74/76 quality is quoted at £5 to £5 10s. per ton, and the 76/78 quality at £5 15s. to £6 per ton.

PITCH is unchanged with very little business to report. Prices are unaltered.

Latest Oil Prices

LONDON.—LINSEED OIL closed quiet. June £41 15s., July, £40 12s. 6d., August and September-December, £40 15s. January-April, £40 7s. 6d. RAPE OIL quiet. Crude crushed, spot, £48 10s.; technical refined, £51 10s. COTTON OIL firm and 20s. higher. Refined common edible, £49; Egyptian crude, £44; deodorized, £51. TURPENTINE quiet. American spot and August, 67s. 6d.; and September, 68s. 9d. per cwt.

Nitrogen Products Market

Export.—During the week British producers have continued to sell substantial quantities, particularly for the continent on the basis of £11 10s. per ton, f.o.b. in single bags. For more distant markets where double bags are required the basis price, f.o.b. is £12 2s. 6d.; higher prices were being quoted for forward delivery but on account of the threatened coal strike British producers are unwilling to quote for forward positions.

Home.—The home price is unchanged at £12 5s. per ton, delivery to consumer's nearest station in 4-ton lots for neutral quality basis 21·1 per cent. nitrogen. As usual for this period of the year only small sales are being made for home trade.

Coal Stoppage.—If a coal stoppage takes place the British production will be reduced substantially for even if the break were only a short one it would take twelve months for the coke ovens to be operating at their maximum scale. The loss of production during the year ending May, 1926, is calculated at anything from 50,000 to 120,000 tons. Such a drop in production would not mean so much now that sulphate of ammonia is being manufactured in tremendous quantities by synthetic processes, but nevertheless the reduction of supply would result in slightly higher prices.

Nitrate of Soda.—After the large drop of the last week or two the nitrate market is steadier and the price remains about £11 6s. per ton, c.i.f. chief European ports. The statistical position of the nitrate producers is weaker than it was a year ago, but it has yet to be learned whether the recent drop in price will result in larger sales.

American Market Movements

(From *Drug and Chemical Markets.*)

POSITIONS of industrial chemicals show practically no change and prices are being maintained. Formic acid is selling lower due to distressed material in the market. Zinc chloride in large supply. Pyridine advances again and the market continues very strong with upward tendencies still reported. Benzene demand shows no abatement and supplies are short and prices firm. Intermediates quiet but firm.

The market for fine chemicals continues to move in a routine manner with little to excite interest. Prices show practically no change. Fusel oil is weaker, menthol and camphor strong, and quicksilver firm.

Vegetable oils maintain fairly steady positions. China-wood oil moving in a routine way. Animal oils remain strong and white grease is selling readily at high prices. Tallow firm.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

Acid Acetic, 40% Tech.—£21 to £23 per ton.
Acid Boric, Commercial.—Crystal, £40 per ton, Powder, £42 per ton.
Acid Hydrochloric.—3s. 9d. to 6s. per carboy d/d., according to purity, strength and locality.
Acid Nitric, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.
Acid Sulphuric.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
Ammonia Alkali.—£6 15s. per ton f.o.r. Special terms for contracts.
Bleaching Powder.—Spot, £10 10s. d/d; Contract, £10 d/d. 4 ton lots.
Bisulphite of Lime.—£7 10s. per ton, packages extra, returnable.
Borax, Commercial.—Crystal, £25 per ton. Powder, £26 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)
Calcium Chlorate (Solid).—£5 12s. 6d. to £5 17s. 6d. per ton d/d, carriage paid.
Copper Sulphate.—£25 to £25 10s. per ton.
Methylated Spirit 64 O.P.—Industrial, 2s. 5d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.
Nickel Sulphate.—£38 per ton d/d.
Nickel Ammonia Sulphate.—£38 per ton d/d.
Potash Caustic.—£30 to £33 per ton.
Potassium Bichromate.—5d. per lb.
Potassium Chlorate.—3¾d. per lb., ex wharf, London, in cwt. kegs.
Salammoniac.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton. Carr. pd.
Salt Cake.—£3 15s. to £4 per ton d/d. In bulk.
Soda Caustic, Solid.—Spot lots delivered, £15 12s. 6d. to £18 per ton, according to strength; 20s. less for contracts.
Soda Crystals.—£5 to £5 5s. per ton ex railway depots or ports.
Sodium Acetate 97/98%.—£24 per ton.
Sodium Bicarbonate.—£10 10s. per ton, carr, paid.
Sodium Bichromate.—4d. per lb.
Sodium Bisulphite Powder 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.
Sodium Chlorate.—3d. per lb.
Sodium Nitrate refined 96%.—£13 5s. to £13 10s. per ton, ex Liverpool.
Sodium Nitrite 100% basis.—£27 per ton d/d.
Sodium Phosphate, £14 per ton, f.o.r. London, casks free.
Sodium Sulphate (Glauber Salts).—£3 12s. 6d. per ton.
Sodium Sulphide conc. solid. 60/65.—£15 per ton d/d. Contract £14 15s. Carr. pd.
Sodium Sulphide Crystals.—£9 5s. per ton d/d. Contract £9 2s. 6d. Carr. pd.
Sodium Sulphite, Pea Crystals.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

Acid Carbolic Crystals.—4¼d. to 4½d. per lb. Slightly better demand. Crude 60's, no market owing to weakness of crystals.
Acid Cresylic 97/99.—1s. 6d. to 1s. 9d. per gall. Little demand. Pale, 95%, 1s. 5d. to 1s. 6d. per gall. Dark, 1s. 2d. to 1s. 3d. per gall.
Anthracene Paste 40%.—3d. per unit per cwt.—Nominal price. No business.
Anthracene Oil, Strained.—7½d. to 8d. per gall. Unstrained, 6d. to 7d. per gall.
Benzol.—Crude 65's.—11d. to 1s. 3d. per gall., ex works in tank wagons. Standard Motor, 1s. 8d. to 1s. 10d. per gall., ex works in tank wagons. Pure, 1s. 9½d. to 2s. per gall., ex works in tank wagons.
Toluol.—90%, 1s. 8½d. to 1s. 9d. per gall. More inquiry. Pure, 1s. 9½d. to 2s. per gall.
Xylol Commercial.—2s. 3d. per gall. Pure, 3s. 3d. per gall.
Creosote.—Cresylic, 20/24%, 8d. per gall. Standard specification, middle oil, heavy, 5¾d. to 6¼d. per gall. Fair business.
Naphtha.—Solvent 90/160, 1s. 5d. to 1s. 9d. per gall. Demand good. Solvent 90/190, 1s. to 1s. 4d. per gall. Fair demand.
Naphthalene Crude.—Drained Creosote Salts, £3 to £5 per ton. Market quiet. Whizzed or hot pressed. No demand.
Naphthalene.—Crystals and Flaked, £10 to £13 per ton, according to districts. Very quiet.
Pitch.—Medium soft, 40s. to 42s. 6d. per ton, according to district. Slightly more inquiry.
Pyridine.—90/160, 19s. 6d. to 20s. per gall. Heavy, 11s. 6d. to 12s. per gall. Fair business.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated.

Acetic Anhydride 95%.—1s. 7d. per lb.
Acid Anthranilic 7s. per lb. 100%.
Acid Benzoic 1s. 9d. per lb.
Acid H.—3s. 6d. per lb. 100% basis d/d.
Acid Naphthionic.—2s. 2d. per lb. 100% basis d/d.
Acid Neville and Winther.—4s. 10d. per lb. 100% basis d/d.
Acid Salicylic, technical.—11d. to 11½d. per lb. Steady demand.
Acid Sulphanilic.—9d. per lb. 100% basis d/d.
Aluminium Chloride, anhydrous.—10d. per lb. d/d.
Aniline Oil.—7d. to 7½d. per lb. naked at works.
Aniline Salts.—7d. to 8d. per lb. naked at works.
Antimony Pentachloride.—1s. per lb. d/d.
Benzidine Base.—3s. 6d. per lb. 100% basis d/d.
Benzyl Chloride 95%.—1s. 1d. per lb.
p-Chlorphenol.—4s. 3d. per lb. d/d.
p-Chloraniline.—3s. per lb. 100% basis.
o-Cresol 29/31° C.—3d. per lb. Demand quiet.
m-Cresol 98/100%.—2s. 1d. per lb. Demand moderate.
p-Cresol 32/34° C.—2s. 1d. per lb. Demand moderate.
Dichloraniline.—2s. 3d. per lb.
Dichloraniline S. Acid.—2s. 3d. per lb. 100% basis.
Diethylaniline.—4s. 3d. per lb. d/d., packages extra, returnable.
Dimethylaniline.—2s. 1½d. per lb. d/d. Drums extra.
Dinitrobenzene.—9d. per lb. naked at works.
Dinitrochlorbenzene.—£84 10s. per ton d/d.
Dinitrotoluene.—48/50° C. 8d. to 9d. per lb. naked at works. 66/68° C. 1s. per lb. naked at works.
Diphenylaniline.—2s. 10d. per lb. d/d.
G. Salt.—2s. 2d. per lb. 100% basis d/d.
a-Naphthol.—1s. 10d. per lb. d/d.
B-Naphthol.—1s. per lb. d/d.
a-Naphthylamine.—1s. 3d. per lb. d/d.
B-Naphthylamine.—3s. 9d. per lb. d/d.
m-Nitraniline.—3s. 9d. per lb. d/d.
p-Nitraniline.—1s. 11d. per lb. d/d.
Nitrobenzene.—5d. to 5½d. per lb. naked at works.
o-Nitrochlorbenzol.—2s. 3d. per lb. 100% basis d/d.
Nitronapthalene.—10d. per lb. d/d.
p-Nitrophenol.—1s. 9d. per lb. 100% basis d/d.
p-Nitro-*o*-amido-phenol.—4s. 6d. per lb. 100% basis.
m-Phenylene Diamine.—4s. per lb. d/d.
p-Phenylene Diamine.—9s. 9d. per lb. 100% basis d/d.
R. Salt.—2s. 4d. per lb. 100% basis d/d.
Sodium Naphthionate.—2s. 2d. per lb. 100% basis d/d.
o-Toluidine.—10d. per lb.
p-Toluidine.—2s. 3d. per lb. naked at works.
m-Toluylene Diamine.—4s. per lb. d/d.

Wood Distillation Products

Acetate of Lime.—Brown £9 10s. to £10. Quiet market. Grey £15 per ton. Liquor, 9d. per gall. 32° Tw.
Acetone.—£73 per ton.
Charcoal.—£7 5s. to £8 10s. per ton, according to grade and locality.
Iron Liquor.—1s. 7d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.
Red Liquor.—10d. to 1s. per gall. 14/15° Tw.
Wood Creosote.—2s. 9d. per gall. Unrefined.
Wood Naphtha, Miscible.—4s. 3d. per gall. 60% O.P. Solvent, 4s. 6d. per gall. 40% O.P.
Wood Tar.—£4 per ton.
Brown Sugar of Lead.—£43 per ton.

Rubber Chemicals

Antimony Sulphide.—Golden, 7¼d. to 1s. 5d. per lb., according to quality. Crimson, 1s. 5d. to 1s. 7¼d. per lb., according to quality.
Arsenic Sulphide, Yellow.—2s. per lb.
Barytes.—£3 10s. to £6 15s. per ton, according to quality.
Cadmium Sulphide.—4s. 4d. per lb.
Carbon Bisulphide.—£25 to £28 per ton, according to quantity.
Carbon Black.—5½d. per lb., ex wharf.
Carbon Tetrachloride.—£55 to £60 per ton, according to quantity, drums extra.
Chromium Oxide, Green.—1s. 3d. per lb.
Diphenylguanidine, 4s. to 4s. 3d. per lb.
Indiarubber Substitutes, White and Dark.—5¼d. to 6¼d. per lb.
Lamp Black.—£43 per ton, barrels free.
Lead Hyposulphite.—9d. per lb.
Lithopone, 30%.—£22 10s. per ton.
Mineral Rubber "Rubpron."—£13 12s. 6d. per ton f.o.r. London.
Sulphur.—£9 to £11 per ton, according to quality.

Sulphur Chloride.—4d. per lb., carboys extra.
Sulphur Precip. B.P.—£50 to £55 per ton.
Thiocarbamide.—2s. 6d. to 2s. 9d. per lb.
Thiocarbanilide.—2s. 1d. to 2s. 3d. per lb.
Vermilion, Pale or Deep.—5s. per lb.
Zinc Sulphide.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

Acid, Acetic 80% B.P.—£40 per ton ex wharf London in glass containers.
Acid, Acetyl Salicylic.—2s. 8d. to 2s. 10d. per lb. British makers meeting foreign competition in quality and price.
Acid, Benzoic B.P.—2s. to 2s. 3d. per lb., according to quantity
Acid, Boric B.P.—Crystal £46 per ton, Powder £50 per ton. Carriage paid any station in Great Britain.
Acid, Camphoric.—19s. to 21s. per lb.
Acid, Citric.—1s. 3½d. to 1s. 4½d. per lb., less 2½%.
Acid, Gallic.—2s. 9d. per lb. for pure crystal, in cwt. lots.
Acid, Pyrogallic, Crystals.—5s 4d. to 5s. 6d. per lb.
Acid, Salicylic.—1s. 2d. per lb., in ton lots. Good demand. Technical.—10½d. to 11d. per lb.
Acid, Tannic B.P.—2s. 8d. per lb.
Acid, Tartaric.—11½d. per lb., less 5%.
Amidol.—9s. per lb., d/d.
Acetanilide.—1s. 5d. per lb. for quantities.
Amidopyrin.—13s. 3d. per lb.
Ammonium Benzoate.—3s. 3d. to 3s. 6d. per lb., according to quantity.
Ammonium Carbonate B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.
Atropine Sulphate.—11s. 6d. per oz. for English make.
Barbitone.—11s. per lb.
Benzonaphthol.—3s. 6d. per lb. spot.
Bismuth Carbonate.—12s. 9d. to 14s. 9d. per lb.
Bismuth Citrate.—11s. 4d. to 13s. 4d. per lb.
Bismuth Salicylate.—10s. 2d. to 12s. 2d. per lb.
Bismuth Subnitrate.—10s. 9d. to 12s. 9d. per lb. according to quantity.
(Prices advanced. Supplies of the metal are still restricted.)
Borax B.P.—Crystal £29, Powder £30 per ton. Carriage paid any station in Great Britain.
Bromides.—Potassium, 2s. 1d. to 2s. 3d. per lb.; sodium, 2s. 2d. to 2s. 4d. per lb.; ammonium, 2s. 6d. to 2s. 8d. per lb., all spot. British or Imported. Prices unchanged. Firm.
Calcium Lactate.—1s. 6½d. to 1s. 8d., according to quantity.
Chloral Hydrate.—3s. 5d. to 3s. 6d. per lb., duty paid.
Chloroform.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
Creosote Carbonate.—6s. 9d. per lb.
Formaldehyde.—£38 per ton, in barrels ex wharf.
Glycerophosphates.—Fair business passing. Calcium, soluble and citrate free, 7s. per lb.; iron, 8s. 9d. per lb.; magnesium, 9s. per lb.; potassium, 50%, 3s. 6d. per lb.; sodium, 60%, 2s. 6d. per lb.
Guaiacol Carbonate.—6s. 3d. to 6s. 6d. per lb.
Hexamine.—2s. 4d. powder crystal, 2s. 6d. free running crystal, per lb.
Homatropine Hydrobromide.—30s. per oz.
Hydrastine Hydrochloride.—English make offered at 120s. per oz.
Hydrogen Peroxide (12 vols.).—1s. 8d. per gallon f.o.r. makers' works, naked.
Hydroquinone.—4s. 1½d. per lb.
Hypophosphites.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
Iron Ammonium Citrate B.P.—1s. 8d. to 1s. 11d. per lb. Green, 2s. 2d. to 2s. 7d. per lb. U.S.P., 1s. 7d. to 1s. 10d. per lb.
Magnesium Carbonate.—Light Commercial, £34 per ton net. Light pure, £46 per ton.
Magnesium Oxide.—Light Commercial, £65 per ton, less 2½%, price reduced; Heavy Commercial, reduced to £24 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.
Menthol.—A.B.R. recrystallised B.P., 46s. 9d. per lb.; prompt delivery. Synthetic, 22s. 6d. to 31s. 6d. per lb., according to quality. English make.
Mercurials.—Red oxide, 5s. 2d. to 5s. 4d. per lb.; Corrosive sublimate, 3s. 7d. to 3s. 9d. per lb.; white precipitate, 4s. 6d. to 4s. 8d. per lb.; Calomel, 3s. 10d. to 4s. per lb. Very quiet.
Methyl Salicylate.—1s. 4½d. to 1s. 8d. per lb.
Methyl Sulphonal.—17s. 9d. per lb.
Metol.—11s. per lb. British make.
Paraformaldehyde.—2s. for B.P. quality.
Paraldehyde.—1s. 4d. per lb., in free bottles and cases.
Phenacetin.—4s. 2d. to 4s. 3d. per lb. in cwt. lots.
Phenazone.—6s. 2d. per lb.
Phenolphthalein.—4s. 1d. per lb.
Potassium Bitartrate 99/100% (Cream of Tartar).—72s. per cwt., less 2½% for ton lots.
Potassium Citrate.—1s. 7d. to 1s. 10d. per lb.
Potassium Ferricyanide.—1s. 9d. per lb. Quiet.
Potassium Iodide.—16s. 8d. to 16s. 11d. per lb., according to quantity. Steady market.
Potassium Metabisulphite.—6d. to 7½d. per lb., 1-cwt. kegs included, f.o.r. London.
Potassium Permanganate.—B.P. crystals, 7½d. per lb., spot.
Quinine Sulphate.—2s. 3d. to 2s. 4d. per oz., in 100 oz. tins. Steady market.
Resorcin.—3s. 9d. per lb. In fair quantities.
Saccharin.—63s. per lb. in 50 lb. lots.
Salol.—3s. 3d. to 3s. 6d. per lb.
Silver Proteinate.—12s. per lb. for satisfactory product light in colour.
Sodium Benzoate, B.P.—1s. 10d. to 2s. 2d. per lb.
Sodium Citrate, B.P.C., 1911.—1s. 4d. to 1s. 7d. per lb., B.P.C., 1923, 1s. 7d. to 1s. 8d. per lb., according to quantity. U.S.P., 1s. 7d. to 1s. 10d. per lb.
Sodium Hyposulphite, Photographic.—£14 to £15 per ton, according to quantity, d/d consignee's station in 1-cwt. kegs.
Sodium Metabisulphite Crystals.—37s. 6d. to 60s. per cwt., net cash, according to quantity.
Sodium Nitroprusside.—16s. per lb.
Sodium Potassium Tartrate (Rochelle Salt).—75s. per cwt., for ton lots and upwards.
Sodium Salicylate.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 2s. to 2s. 2d. per lb. Flake, 2s. 3d. to 2s. 4d. per lb.
Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb.
Sodium Sulphite, anhydrous, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.
Sulphonal.—12s. 8d. per lb.
Thymol.—15s. per lb.

Perfumery Chemicals

Acetophenone.—9s. per lb.
Aubepine (ex Anethol).—10s. per lb.
Amyl Acetate.—3s. per lb.
Amyl Butyrate.—6s. 6d. per lb.
Amyl Salicylate.—3s. 1½d. per lb.
Anethol (M.P. 21/22° C.).—5s. per lb.
Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s. 6d. per lb.
Benzyl Alcohol free from Chlorine.—2s. 6d. per lb.
Benzaldehyde free from Chlorine.—3s. per lb.
Benzyl Benzoate.—2s. 9d. per lb.
Cinnamic Aldehyde Natural.—15s. 6d. per lb.
Coumarin.—14s. per lb.
Citronellol.—19s. per lb.
Citral.—8s. 6d. per lb.
Ethyl Cinnamate.—9s. per lb.
Ethyl Phthalate.—3s. per lb.
Eugenol.—9s. 6d. per lb.
Geraniol (Palmarosa).—27s. per lb.
Geraniol.—8s. to 16s. per lb.
Heliotropine.—6s. 3d. per lb.
Iso Eugenol.—14s. 6d. per lb.
Linalol ex Bois de Rose.—20s. per lb.
Linalyl Acetate.—18s. 6d. per lb.
Methyl Anthranilate.—9s. 3d. per lb.
Methyl Benzoate.—5s. per lb.
Musk Ambrette.—50s. per lb.
Musk Ketone.—37s. 6d. per lb.
Musk Xylol.—9s. 6d. per lb.
Nerolin.—4s. per lb.
Phenyl Ethyl Acetate.—15s. per lb.
Phenyl Ethyl Alcohol.—13s. per lb.
Rhodinol.—37s. 6d. per lb.
Safrol.—1s. 8d. per lb.
Terpineol.—1s. 10d. per lb.
Vanillin.—21s. 6d. to 23s. 6d. per lb.

Essential Oils

Almond Oil, Foreign S.P.A.—13s. 3d. per lb.
Anise Oil.—3s. 6d. per lb.
Bergamot Oil.—17s. 6d. per lb.
Bourbon Geranium Oil.—17s. 6d. per lb.
Camphor Oil.—60s. per cwt.
Cananga Oil, Java.—11s. 3d. per lb.
Cinnamon Oil, Leaf.—5d. per oz.
Cassia Oil, 80/85%.—9s. 3d. per lb.
Citronella Oil.—Java, 85/90%, 4s. 6d. per lb. Ceylon, 2s. 8d. to 2s. 10d. per lb., according to quality.
Clove Oil.—6s. 9d. per lb.
Eucalyptus Oil, 70/75%.—1s. 9d. per lb.
Lavender Oil.—French 38/40% Esters, 28s. 6d. per lb.
Lemon Oil.—5s. 3d. per lb. Receding.
Lemongrass Oil.— 5s. per lb.
Orange Oil, Sweet.—10s. 9d. per lb.
Otto of Rose Oil.—Bulgarian, 60s. per oz. Anatolian, 35s. per oz.
Palma Rosa Oil.—13s. 9d. per lb.
Palma Rose Oil.—15s. 3d. per lb.
Peppermint Oil.—Wayne County. No good quality material available. Japanese, 18s. per lb.
Petitgrain Oil.—9s. per lb.
Sandal Wood Oil.—Mysore, 26s. per lb. Australian, 18s. 6d. per lb.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, July 31, 1925.

WITH the possibility of a coal stoppage at the end of the present week, the heavy chemical market has been somewhat unsettled. Precautionary buying has been in evidence, but on the whole business has been slow. Prices both for home and continental products show little change.

Industrial Chemicals

ACID ACETIC.—In moderate request and price unchanged. 98/100% glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports. 80% pure, £40 to £42 per ton. 80% technical, £39 to £41 per ton, packed in casks, c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated, or small flaked, £40 per ton. Powdered, £42 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In little demand and price unchanged at about 4¼d. per lb. delivered.

ACID CITRIC, B.P. CRYSTALS.—In good demand and price unchanged at about 1s. 4¾d. per lb., less 5% ex store. Offered for early delivery from the continent at 1s. 4½d. per lb., less 5%, ex wharf.

ACID FORMIC, 85%.—Offered for prompt shipment from the continent at about £47 per ton, c.i.f. U.K. ports. Spot material quoted £49 per ton, ex store.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC, 80°.—Usual steady demand quoted £23 15s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Spot material now quoted 3½d. per lb., ex wharf.

ACID SULPHURIC.—144°, £3 12s. 6d., per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Rather easier in price. Now quoted 1s. per lb., less 5% ex store. Offered for prompt shipment at about 11¼d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18% IRON FREE.—Spot lots quoted £6 10s. per ton, ex store. Offered for prompt shipment from the continent at about £6 5s. per ton, c.i.f. U.K. ports.

ALUM, LUMP POTASH.—Spot material quoted £9 7s. 6d. per ton, ex store. Offered for prompt shipment at about £8 5s. per ton, c.i.f. U.K. ports.

AMMONIA ANHYDROUS.—Quoted 1s. 4½d. per lb., ex station, prompt delivery. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton. Packed in 5 cwt. casks, delivered U.K. ports.

AMMONIA LIQUID, 880°.—In steady demand. Unchanged at 2½d. to 3d. per lb., delivered according to quantities.

AMMONIA MURIATE.—Grey galvanisers' crystals quoted £28 per ton, ex station. Offered from the continent at about £24 per ton, c.i.f. U.K. ports. Fine white crystals quoted £19 10s. pre ton, c.i.f. U.K. ports.

ARSENIC.—Refined white Cornish arsenic at about £25 per ton, ex wharf, early delivery. Spot lots quoted £26 per ton, ex store. Foreign arsenic quoted £23 5s. per ton, c.i.f. U.K. ports.

BARIUM CARBONATE, 98/100%.—Offered from the continent at £7 15s. per ton, c.i.f. U.K. ports, prompt shipment.

BARIUM CHLORIDE.—Spot material now offered at about £9 15s. per ton, ex store. Quoted £8 5s. per ton, c.i.f. U.K. ports, prompt shipment from the continent.

BLEACHING POWDER.—Spot lots English material, £10 10s. per ton, ex station. Contracts, 20s. per ton less. On offer from the continent at about £8 7s. 6d. per ton, c.i.f. U.K. ports.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £24 10s. per ton; crystals, £25 per ton; powdered, £26 per ton. Carriage paid U.K. stations, minimum ton lots.

CALCIUM CHLORIDE.—English material unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, carriage paid U.K. stations. Continental on offer at about £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 5s. per ton, ex works, packed in casks free.

COPPER SULPHATE.—Quoted £23 per ton, ex store, spot delivery. English material for export about £24 10s. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Offered for prompt shipment from the continent at £38 10s. per ton, c.i.f. U.K. ports. Spot material available at about £39 10s. per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental offered at about £3 per ton, c.i.f. U.K. ports.

LEAD, RED.—Spot material quoted £42 per ton, ex store. On offer from the continent at about £40 per ton, c.i.f. U.K. ports.

LEAD, WHITE.—Unchanged at about £42 10s. to £43 per ton, ex store, spot delivery.

LEAD ACETATE.—White crystals quoted £44 10s. per ton, spot delivery. Brown, £43 per ton, ex store. White crystals on offer from the continent at £43 15s. per ton, c.i.f. U.K. ports. Brown about £38 per ton, c.i.f. U.K. ports.

LEAD NITRATE.—In moderate demand. Quoted £42 per ton, ex station or f.o.b.

MAGNESITE, GROUND CALCINED.—Usual steady demand and price unchanged at about £8 per ton, ex station.

MAGNESIUM CHLORIDE.—Offered from the continent at £5 per ton, c.i.f. U.K. ports. Spot material still available at about the same figure, ex store.

POTASH CAUSTIC, 88/92%.—Offered for prompt shipment at about £28 5s. per ton, ex wharf. Spot material quoted at about £30 per ton, ex store.

POTASSIUM BICHROMATE.—Price for home consumption, 5d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Quoted £25 5s. per ton; c.i.f. U.K. ports. Spot material available at about £26 5s. per ton, ex store.

POTASSIUM CHLORATE.—Still scarce for early delivery. Some available at about 3¾d. per lb., c.i.f. U.K. ports. Spot material quoted 4d. per lb., ex store.

POTASSIUM NITRATE, SALTPETRE.—99% refined granulated quoted at about £24 10s. per ton, c.i.f. U.K. ports. Spot material quoted £27 per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—On offer at 7¼d. per lb., ex store. Offered for prompt shipment from the continent at about 7¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE, YELLOW.—Nominally 7¼d. per lb., ex store, but this price could be shaded for fairly large quantities.

SODA CAUSTIC.—76/77%, £18 per ton; 70/72%, £16 12s. 6d. per ton. Broken, 60%, £17 2s. 6d. per ton. Powdered, 98/99%, £21 7s. 6d. per ton. All carriage paid U.K. stations, spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—Quoted £19 10s. per ton, ex store, spot delivery. Offered from the continent at about £17 10s. per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM CARBONATE, SODA CRYSTALS.—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. per ton more; alkili 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—English material quoted £9 10s. per ton, ex station. Pea crystals, £14 per ton, ex station. Continental on offer at about £9 5s. per ton, ex store.

SODIUM NITRATE.—Quoted £13 per ton, ex store; 96/98% refined quality 7s. 6d. per ton extra.

SODIUM NITRITE, 100%.—Quoted £24 per ton, ex store. Offered from the continent at about £22 5s. per ton, c.i.f. U.K. ports.

SODIUM PRUSSIATE, YELLOW.—Rather better demand. Spot material now quoted 4¼d. per lb., ex store.

SODIUM SULPHATE, SALTCAKE.—Price for home consumption, £3 10s. per ton, f.o.r. works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE.—English material: Solid, 60/62 per cent., now £13 per ton; broken, £14 per ton; flake, £15 per ton; crystal, £8 10s. per ton. Carriage paid U.K. stations minimum 4 ton lots with slight reductions for contracts to the end of the year. 60/62% solid offered from the continent at £10 15s. per ton, c.i.f. U.K. ports; broken £1 per ton more; 30/32% crystals, £7 15s. per ton, c.i.f. U.K. ports.

SULPHUR.—Flowers, £10 10s.; roll, £9 10; rock, £9 7s. 6d.; ground, £9 10s.; ex store, spot delivery, nominal.

ZINC CHLORIDE.—100% quoted from the continent at £24 5s. per ton, c.i.f. U.K. ports. 97/98 of English manufacture on offer at £25 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Commercial crystals on offer from the continent at about £12 per ton, c.i.f. U.K. ports.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ANTHRANILIC ACID.—Fair home inquiries. 7s. per lb. per 100%.

METANITRANILINE.—Fair home inquiries. 3s. 9d. per lb.

H. ACID.—Fair home inquiries. 3s. 6d. per lb. per 100%.

BENZOIC ACID.—Small home inquiries. 1s. 9d. per lb.

DIMETHYLANILINE.—Good home inquiries. 2s. 1½d. per lb.

N.W. ACID.—Fair home inquiries. 4s. 10d. per lb. per 100%.

PARANITRANILINE.—Good home inquiries. 1s. 11d. per lb.

ORTHO NITRO TOLUOL.—Fair home inquiries. 4½d. per lb.

Company News

HERBERT GREEN AND CO.—Final dividend of 5 per cent., making 10 per cent. for accounting period of ten months.

GAS LIGHT AND COKE CO.—Dividend for the half-year ended June 30 on the ordinary stock at the rate of £5 6s. 8d per cent. per annum—the same as a year ago.

SOUTH METROPOLITAN GAS CO.—Interim dividend has been declared at the rate of 5 per cent. per annum, less tax, on ordinary stock for half-year, payable September 3. This is at the same rate as last year.

ENGLISH CHINA CLAYS, LTD.—Directors announce payment of dividend on cumulative preference shares at 7 per cent. per annum for half-year ended June 30, to be paid August 1 to holders registered July 25, 1925.

JURGENS.—Dividend for half-year ended June 30, 1925, on (guaranteed) 7 per cent. cumulative participating preference shares at 7 per cent. per annum to be paid on August 1, 1925, under deduction of tax, to holders registered July 18, 1925.

UNITED ALKALI COMPANY.—Interim dividend of 3½ per cent. (actual) less tax, payable August 31 on preference shares. Owing to the coal position consideration of an interim dividend on the ordinary shares has been deferred until the board meeting in September.

THE LAUTARO NITRATE COMPANY are issuing £1,000,000 of 6½ per cent. first mortgage (Antofagasta) debenture stock to provide for the redemption of the debentures of the Antofagasta Nitrate Co. The assets of the latter undertaking have been purchased by the Lautaro Co.

HERBERT MORRIS, LTD.—Directors have declared dividends for half-year to January 31, 1925, on the ordinary shares at rate of 7½ per cent. per annum, less tax, at 4s. 6d. in the £. Also a dividend for half-year to July 31, 1925, on 6 per cent. (less tax at 4s. 2d.) and 5 per cent. (free of tax up to 6s. in £) cumulative preference shares.

VICKERS, LTD.—Directors announce that the following interim dividends for the half-year ended June 30, 1925, will be paid to holders registered on August 12, 1925: 2½ per cent. on preferred 5 per cent. stock (less tax), 2½ per cent. on 5 per cent. preference shares (less tax), 2½ per cent. on cumulative preference shares (free of tax). Payment will be made on August 31, 1925.

STANDARD CHEMICAL CO.—A circular to shareholders, issued by the London committee, states that in view of the continued unsatisfactory trading and the uncertain future indicated therein the London committee considered it desirable that the annual general meeting to be held on July 30 in Toronto should be adjourned, and that in the meantime Mr. M. L. Davies, the new president, should visit London to discuss the position with the committee and place his views before the shareholders on this side. Arrangements have been made accordingly to secure the adjournment of the annual meeting in Toronto, and Mr. Davies has now arrived in London.

WELSBACH LIGHT CO.—After debiting to profit and loss account the loss made by the subsidiary company (£6,997), and crediting £17,188 no longer required for Inland Revenue taxation reserve, the credit at profit and loss account is £11,227. Balance brought in of £22,966 makes a total of £34,193. Board recommends the transfer to general reserve, at present £64,000, of discount on debenture stock redeemed during the year amounting to £584, and the profit on realisation of investments £238. Dividend of 5 per cent., less tax, is proposed, leaving £20,474 to be carried forward, subject to income tax. A similar dividend was paid a year ago.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

PIG-IRON AND FERRO-MANGANESE.—South African Railways and Harbours invite tenders for the supply of pig-iron and ferro-manganese 80 per cent. Tenders to be received at Johannesburg by August 27. Firms requiring further details should quote Reference A.X. 2221 to the D.O.T.

EDIBLE DEODORISED SOYA BEAN OIL and CALCIUM CARBIDE.—A commission agent in Casablanca, Morocco, desires to represent a British manufacturer or exporter of above goods.

CHEMICALS, DRUGS, SOAPS.—An agent established in Berlin-Zehlendorf desires to represent British manufacturers of the above.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to August 29, 1925.

"KYLTAH."

459,118. For chemical substances prepared for use in manufactures, photography, or philosophical research, and anti-corrosives. Hadfields (Merton), Ltd., Western Road, Mitcham, Surrey, enamel manufacturers. May 21, 1925.

"BITUSERVATIVE."

459,316. For chemical substances used in manufactures, photography, or philosophical research and anti-corrosives. Class 1. Johnstons, Ltd., 74, York Street, Glasgow, and St. Ninian's Works, 5, Old Church Street, Leith, oil, paint, and varnish manufacturers. May 28, 1925.

"MACINALIN."

459,545. For chemical substances used in manufactures, photography, or philosophical research and anti-corrosives. McInnes Compositions Co. (1921), Ltd., 2 and 3, Duke Street, St. James's, London, S.W.1, anti-corrisive and anti-fouling composition manufacturers. June 8, 1925.

"SUPEROL."

459,915. For chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. Murphy and Son, Ltd., The Cedars, Sheen Lane, Mortlake, London, S.W.14, technical chemists. June 20, 1925.

Concrete-lined Iron Pipes

ENGINEERS are aware that there are certain waters which have a deleterious effect upon metal pipes. The presence of humic acid, iron bacteria, or local electrolytic action often result in incrustation and corrosion, and demand an allowance in the size of the bore to accommodate the ultimate effective carrying capacity of the pipe. This allowance has been computed to be about 33⅓ per cent. It is now established that spun concrete is impervious to these deleterious actions, no adverse chemical reaction taking place, and is so advantageous for the conveyance of soft or peaty waters that engineers estimate that an allowance of only 6 per cent. is necessary. In cases where working conditions are such that it is an unfeasible proposition to use ordinary concrete pipes, iron pipes with a lining of concrete prove a solution to these troubles. Concrete spun centrifugally has a natural affinity for iron, it being impossible to separate them when the concrete has matured. The Stanton Ironworks Co., Ltd., Nottingham, describe, in a pamphlet just issued, their hume concrete-lined iron pipes in sizes from 4 in. to 72 in. diameter. Atmospheric temperature appears to have no effect upon concrete-lined metal pipes. Although the conductibility of cast iron is much higher than that of concrete, variation of temperature does not cause separation of concrete and metal as is indicated by the following tests.

Pipes were submitted to varying temperatures from 80° to 200° F. and no separation occurred; to ensure thorough tests the pipes were rolled from the heating chamber directly into the cold air and *vice-versa*. Pipes were put into cold storage at 1° F. for 24 hours with no effect on the lining. Pipes were immersed in water for 24 hours then placed in a refrigerator chamber at a temperature of 56° to 25° F., no effect being noticed. Apart from protection, the concrete lining gives a material increase in the strength of the pipe to resist external pressure. The concrete bends with the iron without cracking. On fracture the break follows that of the iron and shows no splintering.

Tariff Changes

BRITISH INDIA.—The Customs duty on printers' ink is raised from 2½ to 5 per cent. *ad valorem*.

BELGIUM.—The export of sacchrose sugar (raw, crystallised or refined) is no longer subject to licence.

FRANCE.—A new law provides that the Turnover Tax on coal, lignite, coke and briquettes is only to be applied to sales effected by exploiters of coal mines or coke manufacturers and to importation. In the case of a coke works attached to a metallurgical works the tax is due on the value of the production made over by the coke works to the metallurgical works. The rate of the tax on coal, coke, lignite and briquettes is fixed at 1·8 per cent.

ITALY.—A Decree prescribes regulations regarding the procedure to be followed in order to secure the application to "linters" and cellulose paper imported to be nitrated for the manufacture of celluloid and the like of the favourable treatment provided for by the Customs Tariff. Cotton waste, known as "linters," purified, washed, and cleaned, when imported for this purpose, is classed under Tariff No. 182A with a duty of 3 lire (gold) per 100 kilogs. Cellulose in the form of smooth and polished or crepe paper imported for the purpose specified is, under Tariff No. 846B, free of duty under the Conventional Tariff.

A Decree dated June 30 lays down regulations subject to which liquid derivatives of toluol destined for the manufacture of explosives may be imported into Italy as "organic chemical products, not specially mentioned in the Tariff (Tariff No. 769), the duty (including "coefficient") payable being 39 gold lire per 100 kilogs.

Copies of both Decrees may be seen by persons interested at the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1.

LATVIA.—As from August 9, 1925, Customs duties on the undermentioned naphtha products imported into Latvia will be levied as follows:—

Tariff No.	Article.	"Minimum" Tariff Rate of Duty.	"Maximum" Tariff Rate of Duty.
		Lats. per kilog. (net weight).	
85	Liquid products distilled from naphtha:—		
	1. Unpurified, all kinds..	0·02	0·03
	2. Kerosene and photogen.....	0·04	0·06
	3. Petrol naphtha-ether, gasoline, ligroin, and the like..	0·20	0·30
	4. Solar oil, paraffin and lubricating oil	0·30	0·40

SERB-CROAT-SLOVENE KINGDOM.—A new Tariff covers varnishes, lacs, glues and cement, ethers, industrial alcohols, volatile oils, perfumery and cosmetics, fertilisers, explosives and lighting goods, oiled or impregnated fabrics (except of rubber). Particulars of the duties on these goods may be obtained from the D.O.T., 35, Old Queen Street, London, S.W.1.

POLAND.—Amended duties are announced in respect of numerous chemical products, including ultramarine, dyeing extracts, alkaloids and their salts, etc. Full details may be inspected only at the D.O.T.

Farm Fertilisers

"FARM Notes on Profitable Farming" is the title of a paper that offers much practical information on the subject of efficient fertilisers. It is published by the British Sulphate of Ammonia Federation, and such practical contributions as "Soil Analysis," "Sulphate of Ammonia and Soil Acidity" and "Hints on Sugar Beet Cultivation" are printed in this summer issue. The paper is well illustrated and farmers are reminded of the free advisory service in all manuring problems that is offered by the Federation.

British Phosphate Report

THE British Phosphate Commission's report for the year ended June, 1924, states that a record quantity, 450,924 tons of phosphate rock was shipped and sold from Nauru and Ocean Islands, this being one-fourth in excess of any previous year. Sales to Australia accounted for 70·67 per cent., to New Zealand 13·45 per cent., to the United Kingdom *nil*, and to other countries 15·87 per cent. The United Kingdom did not exercise her right to 42 per cent. of the output.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

MARGINSON, C., Whitestake, near Preston, manufacturing chemist. (C.C., 1/8/25.) £10·6s. 11d. June 26.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

SQUIRE AND CO., BIRMINGHAM, LTD., chemists. (M., 1/8/25.) Registered July 17, £800 mortgage, to W. M. Bain, 62, Cambridge Road, King's Heath, cashier, and others; charged on property in Yardley Wood Road and Bondfield Road, Birmingham. *£3,000. July 30, 1924.

SYNTHETIC AMMONIA AND NITRATES, LTD., Billingham. (M., 1/8/25.) Registered July 6, trust deed dated June 24, 1925, securing £2,000,000 debenture stock; charged on properties at Billingham, etc.; also general charge. *Nil. March 27, 1925.

THOMPSON (J. AND J.) AND CO., LTD., Oldham, drug merchants. (M., 1/8/25.) Registered July 13, £3,240 and further advances, mortgage, to Building Society; charged on 8 and 10, Market Street, Shaw. *Nil. December 31, 1924.

Satisfactions

BERRITE, LTD., Hayes, varnish makers. (M.S., 1/8/25.) Satisfaction registered July 17, £2,700 and further advances registered July 29, 1924.

CHADWICK AND SMITH, LTD., Middleton, bleachers. (M.S., 1/8/25.) Satisfaction registered July 17, £6,900, registered June 6, 1906.

GWALIA PRODUCTS, LTD., Forestfach, manufacturers of fullers earth, etc. (M.S., 1/8/25.) Satisfaction registered July 18, £200, registered April 8, 1925.

MARLEY HILL CHEMICAL CO., LTD. (M.S., 1/8/25.) Satisfaction registered July 20, £5,000, part of amount registered June 27, 1921.

WILLIAMS (ROBERT) AND SONS (GORTON), LTD., dyers and finishers, etc. (M.S., 1/8/25.) Satisfaction registered July 21, £20,000, registered May 8, 1921.

YOUNG (JOHN) (OF RADCLIFFE), LTD., bleachers, etc. (M.S., 1/8/25.) Satisfaction registered July 18, £6,000, part of amount outstanding July 1, 1908.

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Company Winding Up

SHARP (J.) AND CO., LTD. (C.W.U., 1/8/25.) Winding-up order, July 24.

Company Winding Up Voluntarily

BRIERLEY SANDERS, LTD. (C.W.U.V., 1/8/25.) W. W. Brierley, chartered accountant, 24, Clegg Street, Oldham, appointed liquidator, July 20. Meeting of creditors at The Lyceum, Union Street, Oldham, at 10 a.m., on Tuesday, August 4. Creditors' claims by September 3.

New Company Registered

WATSON WATER SOFTENERS, LTD., Pomeroy House, 28A, Basinghall Street, London, E.C.2. Chemists, engineers, analysts, manufacturers of scale-removing compositions, etc. Nominal capital, £1,500, 10,000 1s. shares and 1,000 £1.